'The reports of my death have been greatly exaggerated'

Mark Twain

CASH REPORT 2016

EUROPE


LACOSTE
LACOSTE
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Contents

Foreword

An often-heard expression when talking about payments and cash is: "Cash is King". And with more than half of all payment transactions in Europe completed with cash, this statement still holds true today.

At the same time, more and more electronic alternatives are becoming available to pay for our goods and services and electronic payment volumes are growing rapidly. Extreme advocates of electronic payments have even declared the "War on Cash" with the ambition to abolish cash completely from our society. Judging by the number of news items on the topic of payments, which is dominated by items on new and more exciting electronic payment instruments (such as mobile payments and virtual currencies), one might conclude that electronic payments are the only way forward, and cash has lost its purpose in our modern society.

Cash payments seem to be losing ground to a point where some claim we are about to enter into a "cashless society" in which everything is paid for by swiping a card, tapping a mobile phone or transferring virtual currencies. It is a popular assumption that cash is on its way out and cash is expensive for society and retailers compared to non-cash alternatives. However, the data and the analysis in this report do not necessarily support these assumptions.

Cash is sometimes compared with a kind of Cinderella: It doesn't have a mum or dad to watch over it – just those horrible stepsisters trying to convince Cinderella she is ugly.

While the general public never turned away from (the use of) cash, also the stakeholder debate on cash versus non-cash has become less bipolar and more balanced, with a new credo: "the world cannot do without cash". The value of cash was in a sense 'rediscovered', especially during recent times of economic, social, financial or political turmoil both in Europe and globally.

In this report we address exactly this debate, by presenting the current status of Cash in Europe and an assessment of how we came to this point. Additionally, current trends and developments in cash and non-cash payments are investigated to deepen our understanding with the ambition to learn from this as we're preparing for the future.

Adding to this European point of view, the report looks at and compares the individual members of the European Union, acknowledging both the overlying ambition to create a single, integrated European marketplace as well as the unique history and individuality of its member states. The most relevant observations (both sim-

ilarities and differences between member states) are highlighted and investigated with the aim to understand the general trends and diversity.

With this report we hope to contribute to a balanced debate about payments in general and cash in particular from a European perspective. We have endeavoured to analyse and present the available data in a transparent and unbiased way in order to further stimulate an open debate.

We are proud to present the results of our analysis of the available data, trends and developments on a pan European level. We feel this represents the most important and essential information on the topic of cash and cash logistics in our market today. However, we welcome any challenge or suggestions for further analysis as this only contributes to the discussion on cash and cash logistics, which in turn will benefit us all.

We hope you enjoy reading the report and we look forward to discussing it with you.

Graham Levinsohn
European CEO
G4S


PUYOL
FABREGAS
XAVI
MANCHESTER UNITED

Introduction

After the single country orientated G4S Cash Reports in 2011 (The Netherlands) and 2013 (Belgium) G4S is proud to present the first pan European Cash Report. Relevant data, trends and developments for all 28 EU member states are included in the analysis of the report supplemented by the views from industry stakeholders in the European cash domain from interviews held with them.

It is our objective to present a descriptive research document; an objective view of the available data and research documents, white papers, policy documents, etc. currently available on the topic of cash in the European Union and its individual member states. Supplemented with our own research and insights, and stakeholder interviews we have compiled this report not with the intention to make or prove a point or steer the discussion in a certain direction, yet to present an objective overview of data, research and perspectives in order to stimulate an open and unbiased discussion with all stakeholders on the further development of the cash market in Europe.

The sentiment of stakeholders seems to move away from "War on Cash" to a more open viewpoint: "The world cannot do without cash".

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Our aim is to establish a baseline of the current status in the EU28 when it comes to cash as a payment instrument and the organisation of cash logistics in the so-called cash cycle across the EU and within its individual member states. Additionally, we try to deepen our understanding of how and why we have arrived at this point, by analysing and offering possible explanations for the most notable findings. By establishing this baseline and understanding our history, we aim to create insight into the future of cash and cash logistics in Europe.

Figure 1 The role and position of the stakeholders in the cash cycle

Stakeholder	Position on cash (versus non-cash) as a payment instrument
European Commission	The European Commission is neutral on payment means and agnostic on which payment means suits citizens and businesses best. Cash and non-cash payment must stay on equal footing and the European legislator shall make sure that in the economy both means can be used for payment under fair conditions and as debtor and creditor freely agree.
European Central Bank	The ECB does not favour cash over non-cash payments or the other way around, i.e. we have a neutral stance. As long as the European citizens want to use cash, we will provide it. And as long as we have cash it is our objective to make sure this is provided and handled in the most cost efficient, resilient and safe way.
European Payment Council	The EPC focuses on the efficiency of payments. For cash the costs are relatively high for banks with, at least at present, very limited direct revenue to balance that.
BEUC	The BEUC is in favour of freedom of choice for consumers also when it comes to the selection of a payment instrument. If consumers prefer to pay with cash or other means of payment, then that's fine. If they stop paying with cash because they prefer alternative payment instruments, then that's fine as well.
EuroCommerce	Cash is just one of the payment instruments we deal with, as such it is not an issue for us. As long as our clients (consumers) want to pay with cash then we will accept it. Our main focus is on reducing the overall cost for accepting payment instruments, cash and non-cash.
ESTA	Cash fulfils unique needs and as long as it does, then cash will remain. The reality is that there is no perfect substitute to cash as yet.

1.1 Methodology

The methodology used for this report is desk research of available sources (list of sources is included in the appendix). Extensive interviews with representatives of the main stakeholders were held with European Central Bank (ECB), European Commission (EC), European Payments Council (EPC), European Consumer Organisation (BEUC), European Retailers Organisation (EuroCommerce) and the Association of Cash in Transit companies (ESTA). A detailed overview of stakeholders interviewed including their biographies is included in the appendix.

1.2 About the Cash Cycle Stakeholders

The stakeholders in the cash cycle all have a different role and perspective on cash as a payment instrument and on cash logistics in Europe. To provide more context to the various stakeholder quotes presented throughout the report, a brief overview of their role and position on those objects is presented in figure 1.

1.3 Report Structure – reading guide

Chapter 1 – Introduction

This chapter provides an introduction to the central topic of this report: cash in Europe. Additionally, it presents the methodology used in this report as well as a reading guide and a management summary. In closing, this chapter provides general background information on Money and the key attributes of cash.

Chapter 2 – EU Trends, Objectives & Key Themes

Chapter 2 describes the overall drivers, trends and developments in the cash domain in Europe. It includes key statistics as well as relevant qualitative findings following our research. This chapter is supported by an overview of quantitative data on a European level, yet also includes individual country data points, if and when relevant for the pan European discussion. The chapter ends with initial observations and discusses the findings on an EU level.

Chapter 3 – Cross-country comparisons

In this chapter research findings of the 28 member states are compared and most relevant conclusions are presented. The chapter ends with initial observations and discusses the findings on cross-country comparisons.

Chapter 4 – Future Scenarios

This chapter looks at potential future developments of the cash market. Possible future scenarios are described and discussed. Key questions are: what is the future of cash as a means of payment? And will there be a fully integrated Europe for cash and cash logistics?

Chapter 5 – Key findings & Closing remarks

Based on the discussions, analyses and observations presented in the previous chapters, this chapter will describe the key findings and closing remarks on the cash market in Europe.

Chapter 6 – Country pages

This final chapter lists all 28 EU-member states which presents the current situation in the cash market, including key-findings and developments. We acknowledge that each country deserves and triggers more detailed analysis yet in this report and for practical purposes we have limited ourselves to the presented highlights.

1.4 Management Summary

This report studies the current status of cash and cash logistics in the European Union. It examines the development over time (2009-2014) for the EU28 as a whole, analyses the similarities and differences between member states, and from that basis looks towards potential futures for cash, cash logistics and cash cycle organisation in the European Union.

Cash is defined as ready money and cash payment transactions consist of banknotes and coins. Cash is legal tender, a unique status among all other payment instruments. In addition, cash has a number of other valued attributes, such as anonymity, security, safe haven, direct settlement, tangible and budgeting tool. These attributes are almost uniquely covered by cash and not by other (non-cash) payment instruments. As long as this is the case, cash is most likely to remain an important payment instrument.

Cash is often perceived to be expensive, however recent ECB and EC studies concluded that cash is less expensive than electronic payments both for society as a whole and also for retailers in particular. Cash and non-cash instruments and infrastructure incur high fixed cost, so the cost per transaction is highly dependent on the transaction volumes.

Cash represents 60% of all payment transactions in the EU28 and it is by far the largest payment instrument in terms of volume; when limited to a C2C or C2B environment, where cash is commonly most used, this percentage would be even higher.

Cash transaction volumes are very difficult to establish given the anonymous nature of cash transactions. Based on key indicators, such as cash in circulation (value, volume and ratio of GDP) and the number and value of ATM withdrawals, the number of cash transactions could also be increasing. However, non-cash transaction volumes, especially card transactions, seem to grow faster, resulting in a diminishing share of cash in the total transaction volume.

The sentiment of stakeholders seems to move away from "War on Cash" to a more open viewpoint: "The world cannot do without cash"; leading to a more balanced debate on how to best organise payments (both electronic and cash payments) to the benefit of our society.

Even though the activities performed within the cash cycle are largely similar, and the objectives for organising cash logistics are the same (efficiency, reliability, safety) there are many variances in which cash logistics is organised across the EU28. Furthermore, optimisation of the cash cycle is done within national borders. At the same time, there is no major need felt among most stakeholders to further integrate and harmonize cash logistics in Europe, in the absence of a clear business case and market demand.

Two general trends are observed in cash cycle organisation across the EU. Firstly, the role of National Central Banks in active participation in operational activities decreases, while the share of activities performed by banks and CITs increases. Secondly, recirculation of cash increasingly takes place at the level of retailers and consumers.

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>
> Cash Report 2016

There are many differences between EU member states when it comes to the availability of, access to and the use of cash (measured in Cash in Circulation, volume and value of ATM withdrawals, nr of offices of MFIs offering payment services, etc). However, in 20 out of 28 countries cash represents over 50% of all payment transactions, and in 26 out of 28 cash is the largest payment instrument in terms of volume.

Restrictions on the use of cash are in place in various countries, such as a maximum amount for cash transactions and/or charges for ATM withdrawals. These restrictions vary per country. Their effectiveness is debated.

The availability of and access to non-cash payment infrastructure (measured by cards issued, POS terminals, % of population with a bank account, internet penetration, etc) differs widely per country. Besides individual country differences, also clusters of countries have been analysed. The largest differences were found between Northern and Southern countries and between Western and Eastern countries in the EU. By and large cash is most dominant in South Eastern countries.

The future of cash and cash logistics is examined through scenario analysis, based on the level of digitalisation (cash vs non-cash) and level of standardisation across the EU28. The current situation for EU28 can be characterised as "Fragmented" but the push towards digitalisation and further EU-level integration seems to suggest a development towards the Digital Integration scenario.

Key data points also seem to indicate a trend away from cash and towards a more integrated Europe. It remains to be seen how quickly and how far this development will go. Key stakeholders are advised to be aware of the underlying dynamics in order to anticipate on future developments and maintain or improve their position in the cash and cash logistics industry.

Overall, it can be concluded that cash still plays a crucial and dominant role in the European payment market and, as long as it continues to (uniquely) cover valued attributes, it is expected to do so for years to come. This is substantiated by our qualitative and quantitative research as well as our stakeholder interviews. Interesting future developments that may have an impact the use of cash and/or the share of cash transactions in the total payment transaction volume are: development of alternative (electronic) payment instruments, increase in the access to and availability of electronic payment infrastructure and, perhaps further down the road, the discussion regarding the unique legal tender status of cash.

1.5 What is Money?

Money is defined as a general metal, paper or non-cash exchange medium[1]. In specific terms, money is regarded as a generally accepted means of making payments by purchasing goods and services and for the repayment of debts. Money therefore has a function that we can distinguish: exchange medium, unit of account, share of value, and (more occasionally) a standard of deferred payments.

1.5.1 Money is Trust!

For decades, money, issued by the National Central Bank's (NCBs), had the function that all notes or coins could be freely converted into precious metals (Gold Standard). The direct convertibility ensured that cash could be trusted. After leaving the Gold Standard, all notes and coins became entirely fiduciary. In all European countries financial transactions are based on the fiduciary system, whereby the main characteristic of cash is not having intrinsic practical value as a physical good. This means that money draws its value from the fact that within Europe, including the European Union, the domestic governments designate it as legal tender. The general acceptance of money as a means of payment for goods and services is fundamentally connected to trust in the (money-creating) government.
In contrast to cash, non-cash money is not tangible. Given that non-cash money is also accepted as a general form of payment, it can also be used to perform the basic functions of money. As soon as trust in money is tainted in some way, the consumer will seek salvation in an alternative form that is trusted.

1 Definition taken from the Big van Dale Dictionary

In this cash report, cash is understood to mean ready money or cash. In addition, the cash area is defined as the total area within which ready cash is physically used and circulated. For this report the cash area is located within the 28 member states of the European Union. Furthermore, in this report the cash area is placed in the context of the whole payment system in EU28, including non-cash payment transactions.

Cash payment transactions consist of banknotes and coins. Both are legal tenders. Currently the EU28 cash area has 10 different currencies, with the Euro being the most widely used currency in 19 countries: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Republic of Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Portugal, Slovakia, Slovenia and Spain.

Euro Banknotes

Since 2002, euro banknotes have been produced jointly by the NCBs of the euro area. Each NCB is responsible for, and bears the costs of, a proportion of the total annual production in one or more denominations.

The annual production of euro banknotes needs to be sufficient to meet expected increases in demand, such as seasonal peaks, and to replace unfit banknotes. It also has to be able to cope with unexpected surges in demand.

Euro banknotes come in 6 denominations: 5, 10, 20, 50, 100 and 500 euro. With over 7,8 million notes[2] in circulation the 50 euro note is the most

2 ECB Statistics/June 2015

widely available denomination. The first Euro note series are currently being replaced by the so-called "Europa-series".

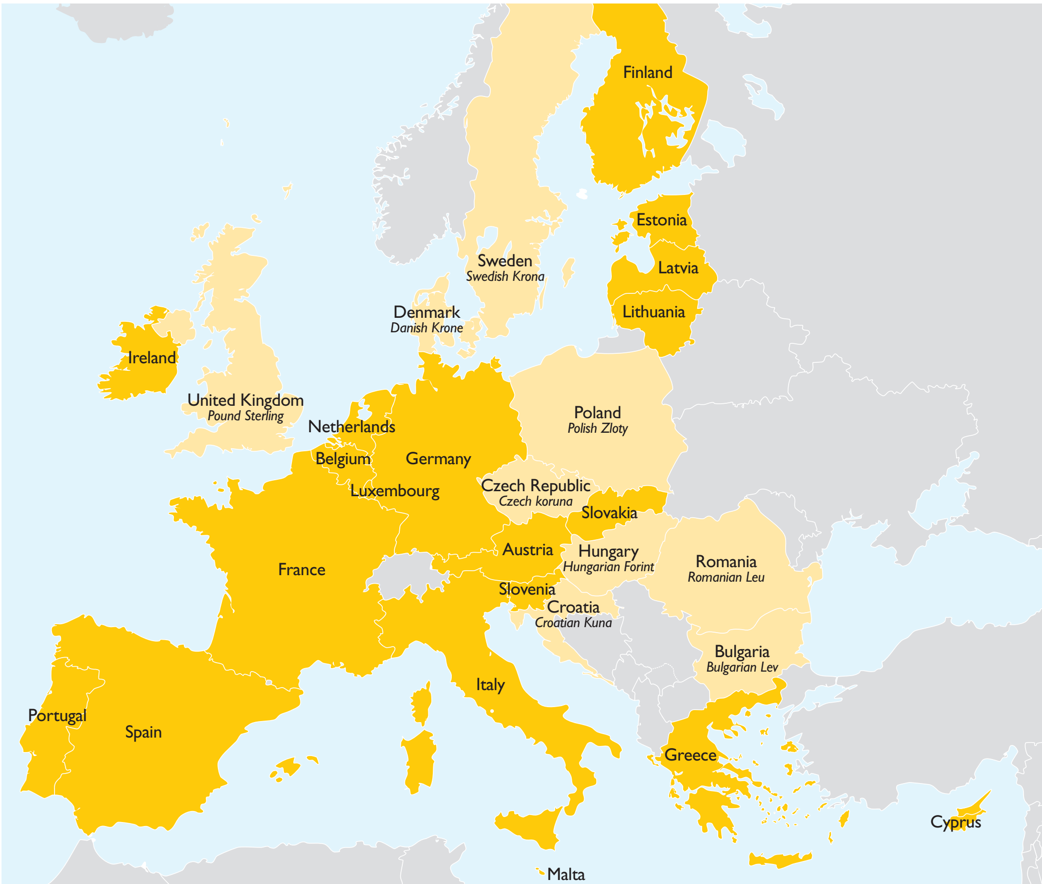
Most recently, the new 20 euro banknote was issued (November 2015) as part of the phased introduction of the Europa series. The 5 and 10 euro notes of the Europa series were already introduced in 2013 and 2014 respectively.

Euro Coins

Responsibility for minting euro coins lies with the national governments of the euro area countries. However, it is the Governing Council of the ECB who approves the overall value of the coins to be put into circulation.

The euro coin series comprises eight different denominations: 1, 2, 5, 10, 20 and 50 cent, 1 and 2 euro. The euro coins have a common side and a

Figuur 2 Valuta's binnen de EU28



national side. The national side indicates the issuing country. The common sides of the coins were designed by Mr Luc Luycx of the Royal Belgian Mint. With over 30 million coins[3] in circulation the 1 cent coin is the most widely available denomination.

1.6 Key Themes in Financial Services, Payments and Cash

There are several key themes to define in Financial Services, payments and cash in particular like efficiency, availability, reliability and safety.

1.6.1 Efficiency

Efficiency is defined in terms of cost effectiveness, typically measured in the total cost to support the end to end processing of a payment instrument and then defined in unit cost or cost per transaction. Again, this is not a straightforward exercise as both the cost and the number of transactions for cash are difficult to establish.

1.6.2 Availability

This relates to the availability of payments methods to the general public. For instance, for cards payment methods to be available to the public an infrastructure needs to be in place, consisting of cards issuing/acquiring, POS terminals, connections to processing and clearing & settlement mechanisms. For cash this infrastructure is less complicated.

1.6.3 Reliability

Reliability is closely related to availability, yet it is defined in terms of performance or uptime of the end-to-end infrastructure supporting the payment transaction to be completed. In general, cash transactions are much more reliable than non-cash payments. Even though the uptime of electronic payment systems is increasing, the uptime of cash is 100%. This speaks to another key characteristic or function of cash: fall back in case of crisis.

Another form of reliability is captured in the question: "to what extent can I rely on a certain payment instrument being accepted everywhere?" This relates to the unique legal tender status of cash, which essentially ensures 100% acceptance of cash as a means of payment. As we'll see in more detail in 1.7.1 and 2.3.1 this status is under scrutiny as an increasing number of shops in an increasing number of countries have declared themselves cash-free (stating that cash cannot be used within the shops premises as a means of payment). Even though this formally contradicts with the legal status of cash, it is accepted under the notion of contractual freedom.

Even though cash as a means of payment between consumers and retailers is 100% available, Business Continuity of cash logistics is an issue raised by the ECB and discussed with ESTA, the association of CIT companies in Europe.

1.6.4 Safety

Safety is always an important aspect of financial transactions. Aspects such as authorization, authentication and integrity are paramount in every transaction. In case of cash the aspect of safety gets another dimension, as cash represents direct value and therefore attracts criminals. This poses a challenge to banks, CIT companies, retailers and consumers.

3 ECB Statistics/June 2015

Figuur 3 2014 Overzichttabel resultaten

Europese statistieken voor criminaliteit met geldautomaten – overzicht						
Fraude met geldautomaten	**2010**	**2011**	**2012**	**2013**	**2014**	**+/-**
Totaal aantal gemelde incidenten	12,383	20,244	22,450	21,346	15,702	-26%
Totale gemelde schade	€268m	€234m	€265m	€248m	€280m	+13%
Fysieke aanvallen bij geldautomaten	**2010**	**2011**	**2012**	**2013**	**2014**	**+/-**
Totaal aantal gemelde incidenten	2,062	1,818	1,920	2,102	1,980	-6%
Totale gemelde schade	€33m	€28m	€19m	€23m	€27m	+17%

Source: European ATM Security Team, 2015

The European ATM Crime Report[4], covering the full year 2014, reports:

- 26% decrease in ATM related fraud attacks, down from 21,346 in 2013 to 15,702 in 2014.
- 13% increase in the losses due to ATM related fraud attacks when compared with 2013 (up from 248 million to 280 million euro). This rise was largely driven by an 18% rise in international skimming losses (up from 201 million to 238 million euro).
- ATM related physical attacks fell 6% when compared with 2013 (down from 2,102 to 1,980 incidents).
- Losses due to ATM related physical attacks rose 17% to 27 million euro (up from 23 million euro in 2013).
- The average cash loss for ram raids/ATM burglary was 25,640 euro per incident, up from 11,393 euro in 2013. While around 40% of such attacks do not result in cash loss, collateral damage to equipment and buildings can be significant.

4 European ATM Security Team, 2015, www.european-atm-security.eu/european-atm-related-fraud-incidents-fall-26-although-skimming-losses-rise

1.7 Key attributes of Cash

Besides these key themes there are a number of attributes that distinguish cash from other payment instruments. These key attributes of cash are described below:

1.7.1 Cash is legal tender

The legal status of cash is that it is a legal tender. Legal tender[5] is a medium of payment recognized by a legal system to be valid for meeting a financial obligation. Paper currency and coins are common forms of legal tender in many countries. Legal tender is variously defined in different jurisdictions. Formally, it is anything which when offered in payment extinguishes the debt. Thus, personal cheques, credit cards, debit cards, and similar non-cash methods of payment are not usually legal tender.

5 en.wikipedia.org/wiki/Legal_tender

1.7.2 Cash is anonymous

As known, electronic payment transactions leave digital traces, which stimulate verifiability, which in turn is convenient when levying taxes, tracking activities in the informal economy and tracing criminal money. Currently, there are many personal budgeting tools offered by the banks on the basis of electronic banking transactions. However, cash is not traceable, which could be a reason why cash will be slow to lose its appeal.

The informal economy in Europe is estimated to be 2.2 trillion euro[6], varying from 8% of GDP in countries such as Austria and Luxembourg to more than 30% in some central and East European countries (figure 4).

6 Friedrich Schneider, Johannes Kepler University Linz, in 'The Shadow Economy in Europe, 2011

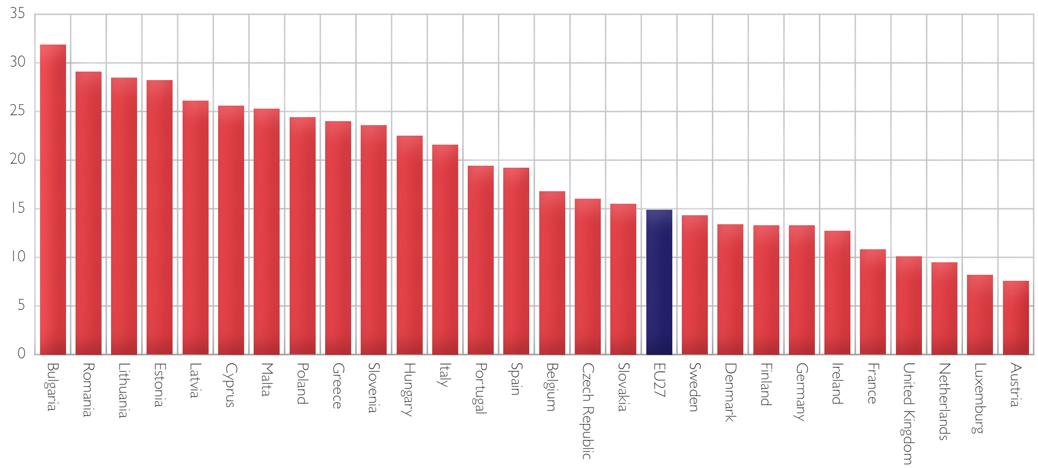
1.7.3 Cash is secure

Cash is not only anonymous, but also simple to save and resistant to system and power failures. For instance: more cash is withdrawn or collected if people go on holiday abroad, given that one does not always know whether it will always be possible to pay locally with a credit card or debit card. This also plays a role in themes like availability and reliability, which will be discussed in chapter 2.3.

1.7.4 Cash is a safe haven

Another attribute of cash is that of a Safe Haven in case of a crisis. All across the world we see that national banks bring in large amounts of cash money as a first measure in order to keep the day to day economy going and prevent further escalation of the crisis situation. Ton Roos, ECB commented: "We've seen this in New Orleans

Figuur 4 Grootte van de schaduweconomie (in % van het bbp, EU27, 2012)



Source: Friedrich Schneider, Johannes Kepler University Linz, in 'The Shadow Economy in Europe, 2011 with Hurricane Katrina in 2005 and with the tsunami and nuclear disaster in Japan in 2011. But also during financial crises we saw people resorting to the use of cash."

This is reiterated by John Williams, CEO of the Federal Reserve of San Francisco in their 2012 annual report: "… in the six months following the fall of the investment bank Lehman Brothers in 2008, holdings of $100 bills soared by $58 billion, a 10% jump."[7]

Ton Roos continues: "In case of a financial crisis in non-Euro countries we have seen an increase in the conversion of the local currency into euros. The same goes for Dollars, Yens, Pounds Sterling, or any other foreign currency that is perceived to be more stable at that time. But also in the euro area we have seen a strong increase in the demand for cash at times of turmoil in the financial markets or in the case of sovereign debt crises. The supply of cash via ATMs has proven to be very important when banks had to be closed for a prolonged period of time."

Cash Hoarding

The phenomenon of cash as a safe haven translates on a more individual level to the concept of cash hoarding. Hoarding occurs when people are taking more money from their bank accounts than they would normally need for day-to-day use and store it 'under a pillow'.
Ton Roos, ECB: "This is another important function of cash. Exact numbers are hard to provide, yet according to our estimates around 2/3 of the total amount of cash in circulation is used for hoarding. This means that 'only' 1/3 is used for actual transactions. Hoarding occurs mostly with larger denominations (200 and 500 euro), yet we estimate that almost half of the 50 euro notes is also used for this purpose."

The demand for cash (for transactional, hoarding or any other purpose) is influenced by 3 factors:

1. Stability in the society (economic/social/financial/political): If a society is unstable or a crisis occurs, demand for cash and the level of hoarding increases.
2. Interest rate: with lower interest rates, the level of hoarding goes up. Over recent years interest rates have been very low, and consequently checking and short-term savings accounts offer extraordinarily low interest rates, if they pay anything at all. This dramatically lowers the opportunity cost of holding cash, as people simply have little incentive to put cash back into the banks.
3. Trust in financial sector and banks in particular. This is obviously related to the first point: with decreasing financial stability or even financial crisis, trust in the (electronic) financial system goes down and the demand for cash goes up, leading to more cash in circulation and more hoarding.

From this it would be expected that when economic stability increases and interest rates go up, the amount or at least the growth rate of cash in circulation would go down.

7 John Williams, CEO of Federal Reserve Bank of San Francisco; 2012 Annual Report

1.7.5 Cash is direct

A big advantage of cash payments is that no third party needs to be involved. For consumer-to-consumer payments cash withdrawals result in a direct transaction between two parties. Ready cash is accepted almost everywhere and also provides the opportunity to pay quickly and easily in almost all circumstances – A cash payment is also easy to reverse: no good, money back. The impossibility of or technical obstacles to repayment in the case of electronic payments could be an argument for retailers to continue to hold cash in their shops. Recent innovations such as the (planned) introduction of Instant Payments across Europe and the possibility to refund value for returned goods directly to your current account (e.g. "Retourpinnen" in The Netherlands), might challenge cash on this attribute. See 2.2.4 and 2.3.2 for more on these innovations.

1.7.6 Cash is tangible and helps with budgeting

Cash is more than a convenient method of payment. One of the main attributes of cash is that it simplifies budgeting and allows a large group of consumers to handle money more responsibly. For people who find it difficult to manage an electronic budget, cash has an important symbolic value: when it's gone, it's gone. For many population groups in our society ready cash is a 'safe haven' that forms the foundation for the way they operate economically and socially.

1.7.7 Cash is (in)secure

Of course there are also disadvantages related to the use of cash for the consumer. Ready cash is clearly less practical when paying (very) large amounts. There are also security issues, although forging banknotes is becoming increasingly difficult. Ready cash is also fairly easy to steal (you can be pickpocketed in the street, mugged at the ATM, have your house broken into). All this should mean that the consumer might regard the use of cash as less safe than making card payments or paying electronically on the Internet. However, recent research indicates that the situation is less clear-cut.

The use of ready cash brings the risk of loss and theft, but the losses will be limited to the amount seized. From the point of view of the retailer, holding ready cash involves an even greater risk, given the substantial amounts that are kept in the tills and backoffice vaults. Non-cash payment instruments can reduce this risk. For payments between private individuals, however, ready cash is the only payment instrument without any use of or intervention from another device.

The question is whether ready cash would be considered so great a risk if all retailers were to make optimum use of the opportunities offered by the market players in order to protect the cash cycle or if the law were to manage to achieve a more successful tracing policy. Specifically the question arises of whether the (in)security of cash can be regarded as a stand-alone issue. Retailers who are the victims of a false card payment or other forms of non-cash fraud can equally fall victim to an unsafe situation, albeit on a different scale. On the other hand, private individuals can suffer both financial and physical damage as a result of a non-cash theft (balance or identity). From this point of view, the insecurity of cash is relative and depending on the security offered by paying electronically.

Skimming

Skimming is the theft of payment card informationused to make purchases or withdraw funds from the victim's bank account. The number of cases of skimming in Europe fell from 5,822 in 2013 to 5,631 in 2014 (-3%)[8], according to the European ATM Crime Report, 2014).

Counterfeit money

Although banknotes are protected against forgery or counterfeiting and the number of counterfeit notes in circulation is low the existence of counterfeit money is inconvenient for consumers, businesses and banks. This may directly harm consumers and/or businesses and it gives rise to the necessary administrative rigmarole.

The ECB publishes a bi-annual update on counterfeit note statistics[9]:

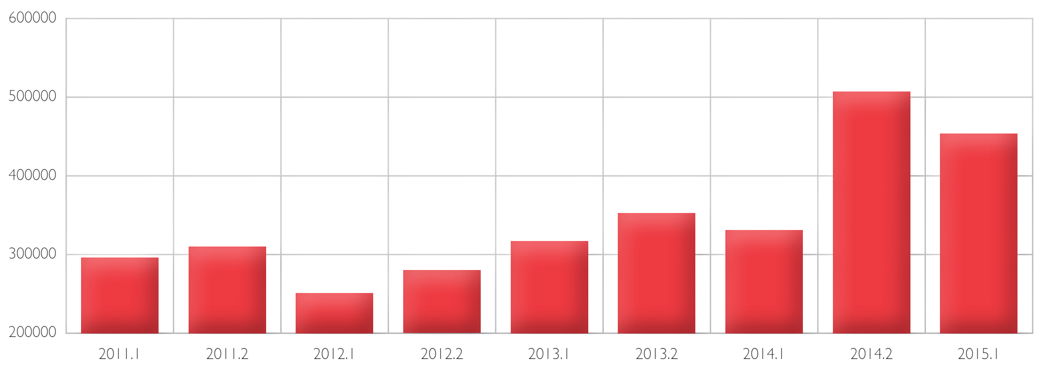
- 454,000 counterfeit euro banknotes were withdrawn from circulation in the first half of 2015 – 10.5% down on the figure for the second half of 2014, but still higher than the first half of 2014
- 86% of the counterfeits are 20 and 50 euro banknotes
- All euro banknotes can be easily verified using the "feel, look and tilt" method
- Euro banknotes continue to be a trusted and safe means of payment.

Overall, the number of counterfeits continues to remain very low in comparison with the increasing number of genuine banknotes in circulation (over 17 billion during the first half of 2015). This comes to only 26.7 counterfeit banknotes per million genuine notes in circulation, or 1 in every 37,500.

8 www.european-atm-security.eu/european-atm-related-fraud-incidents-fall-26-although-skimming-losses-rise/

9 www.ecb.europa.eu/press/pr/date/2015/html/pr150717.en.html

Figure 5 Number of counterfeit notes withdrawn from circulation (Euro, 2011-2015)

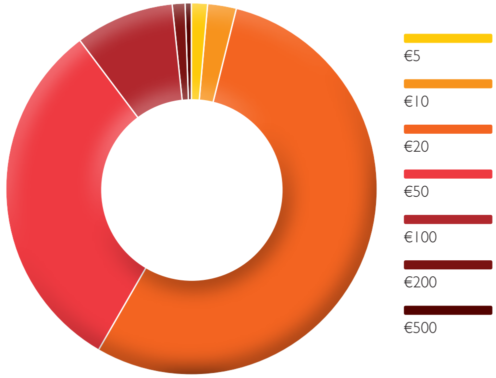


Source: https://www.ecb.europa.eu/press/pr/date/2015/html/pr150717.en.html

A breakdown, by denomination, of the counterfeits withdrawn from circulation in the first half of 2015 is provided below, together with information on their location.

Figure 6 shows that the 20 and 50 euro continued to be the most counterfeited banknotes. They accounted for 86% of the counterfeits, a slight increase over the previous half-year.
97% of the counterfeits were found in euro area countries, only 1.6% were found in EU Member States outside the euro area and less than 0.5% were found in other parts of the world.

Figure 6 Counterfeits withdrawn from circulation by denomination (ECB, H1-2015)



Source: www.ecb.europa.eu/press/pr/date/2015/html/pr150717.en.html

1.7.8 Cash is expensive

An often-heard comment in both the press and the interviews held is "cash is expensive". The costs for the NCB arise in particular from the production and acceptance of banknotes (including printing costs, storage costs, etc.). The commercial banks buy the notes and coins that they need from the NCB. The costs of storing the money includes the rental of storage space, insurance, security, machines, staff and IT systems. Professionals in valuables transport (including money) and logistics transfer also incur costs, e.g. for the necessary staff, logistics and security.

One of the tasks of banks is processing the ready cash that is deposited and withdrawn. These transactions involve costs in the form of renting premises and deploying staff. These costs are relatively constant, irrespective of the number of withdrawals or deposits. Cash machines also involve high fixed costs, but there are also substantial variable costs, in particular for filling the machines and for the settlement fees that the banks pay to each other. Banks also have costs with regard to uncollected interest, administration and the transportation of ready cash between banks and money storage units. Adjustments in the infrastructure of the ready cash as a consequence of legislation also involve costs. In addition, money transporters are subject to strict requirements and regulations as a result of legislation in Europe. This legislation varies between member-states and will be described in further detail in chapter 3. This all adds to the total cost of cash and cash handling.

On the other hand, other non-cash payment instruments, e.g. cards, also incur considerable cost. A cash payment distinguishes itself from an electronic payment because no intermediaries are involved in the transaction. The payment is settled immediately after the notes and coins are handed over. A payment with a payment card, on the other hand, is not completed when the buyer hands the card to the seller.

If a card is inserted into a terminal, information is sent from the card to the terminal and then to the bank of the seller. This is the beginning of what is generally called the Processing, Clearing and Settlement of an electronic payment. First, information about the payment is exchanged and several security checks are performed (Processing). Second, the transmission of information leads to a transfer of (information about) money from the account of the buyer to the account of the seller (Clearing). Finally, payment is only completed when both banks have processed the information on both accounts and the value of the transaction is actually transferred from one bank (account) to the other (Settlement).

For payments with payment cards, infrastructure is therefore required for terminals and systems that can send the information about the payment. Such an infrastructure involves high fixed costs.

Costs of payments

Over the years different stakeholders have conducted studies, in order to map the costs of payment transactions. These studies are different in scope and definitions, usually infrequent and mostly initiated and/or funded by stakeholders. Moreover, they mostly focus on quantifiable aspects, which is not 'the full picture' as Farid

Aliyev, BEUC, illustrates: "When discussing the cost-benefit of a payment instrument, the discussion should not be limited to the quantifiable aspects only. We need to also include non-quantifiable elements and also benefits for various user groups, such as Ease of Use, Convenience, Access and Availability."

A more objective publication from the ECB (2012)[10] discusses the social and private costs of retail payment instruments (for 13 participating EU countries). In relation to this cash report, the main conclusions are:

1 The social costs of retail payment instruments are substantial and amount to 45 billion euro, i.e. 0.96% of GDP. When the sample results from the participating countries are extrapolated to 27 EU Member States, the social costs of retail payment instruments are comparable to those of the sample countries, being close to 1% of GDP or 130 billion euro. These results are robust against the estimation method used.
2 Banks and infrastructures incur half of the social costs, while retailers incur 46% of all social costs. The social costs related to central banks and cash-in-transit companies account for 3% and 1% respectively.
3 Retailers incur higher private costs than banks or infrastructures do, as they face higher external costs to be paid to other payment chain participants.
4 On average, cash payments show the lowest social costs per transaction, followed closely by debit card payments.
5 In some countries, cash does not always yield the lowest unit social costs. In fact, in more than one-third of the sample countries, debit card transactions have lower unit costs than cash transactions.
6 Recent data from Denmark and Hungary suggest that on average about 0.2% of GDP would need to be added to the social costs of retail payments if the costs for households and consumers were considered.
7 Each of the countries participating in the cost study, like every EU27 Member State, has a unique retail payment market with its own market characteristics.

Another study, published by the European Commission in 2015[11], analysed the cost for retailers for accepting cash and card transactions. The analysis showed as a first result that the cost for accepting a card transaction exceeds the cost for accepting a cash transaction for the same amount. Further analysis indicated that the Merchant Interchange Fee (MIF) largely explained the difference, with most other cost components being equal. The report then concludes: "whenever a consumer decides to use a card instead of cash to make a payment, on average the merchants surveyed suffer a negative externality due to the excessive MIF level. That means that the merchants in the sample would be better-off, on average, if the transactions currently executed with cards were carried out by cash."

10 ECB Occasional Paper series Nr 137: The Social and Private Cost of Retail Payment Instruments – a European Perspective, 2012

11 Survey on merchants' costs of processing cash and card payments Final results, European Commission, Directorate-General for Competition, March 2015

> *[...] merchants in the sample would be better-off, on average, if the transactions currently executed with cards were carried out by cash*
>
> European Commission Survey on merchants' costs of processing cash and card payments, March 2015.

In conclusion it can be said that the costs for both cash and non-cash payment transactions are mainly fixed. Consequently, both products benefit from volume in order to minimalize transaction costs per unit; disproportionate promotion of one product over the other does not directly lead to a reduction in the accumulated cost for cash and non-cash payments.

From a total cost perspective: as long as one of the products is not completely abolished, both the (high) fixed cost components remain, and therefore a 'healthy' mix of cash and non-cash payments appears to be best.

Revenue of payments

As both types of payment endure high fixed cost elements, perhaps the key is to look at the revenue side of cash and non-cash payments. This is directly related to ownership, or as Thierry Lebeaux of ESTA articulates: "Cash is public money generating public revenue and electronic money is private money generating private revenue."

Promotion of non-cash payments leads to a shift of costs and (at least) facilitates a potential increase in revenue. Providers of electronic payment services (thus far mainly banks) charge their business clients (Retail and Wholesale) for using electronic payment infrastructures, as a source of revenue. Increasingly, also consumers pay for access to this infrastructure (either through transaction fees, or annual subscription fees for standard banking services, typically: a bank account and a debit card).

When it comes to cash, banks largely pick up the bill for maintaining the cash infrastructure, yet there are, at least at present, none too little revenues to balance this. Leonor Machado, EPC, underlines this point: "Banks are one of the stakeholders in the cash domain, yet we are one of the stakeholders that pay the bill. That's why we're working together with all the other stakeholders to improve the cost efficiency of cash."

At the same time, the user's sentiment towards having to pay for cash services seems to shift across EU28 as well. In some countries (such as UK and Greece) so called Independent ATM Deployers (IAD's) are increasingly active and do charge for ATM withdrawals and consumers, apparently, are increasingly willing to pay for these services.

In the next chapter the topic of ATM charges will be discussed in more detail when we look at the current status, trends and developments of cash and cash logistics in Europe.

2 Cash in Europe – current situation, trends and developments

To get a clear view of the current situation in the cash domain in Europe we will outline the most relevant statistical data and present the development over time for the EU28 as a whole completed with other relevant trends and developments currently present in the cash market.

Two extreme and opposing statements often heard when discussing cash as a payment instrument are: "cash is king" and "the war on cash". Obviously, there is more to it than this yet, in essence, these two quotes capture the most central questions on the topic of cash:

How does cash relate to electronic payment methods?,

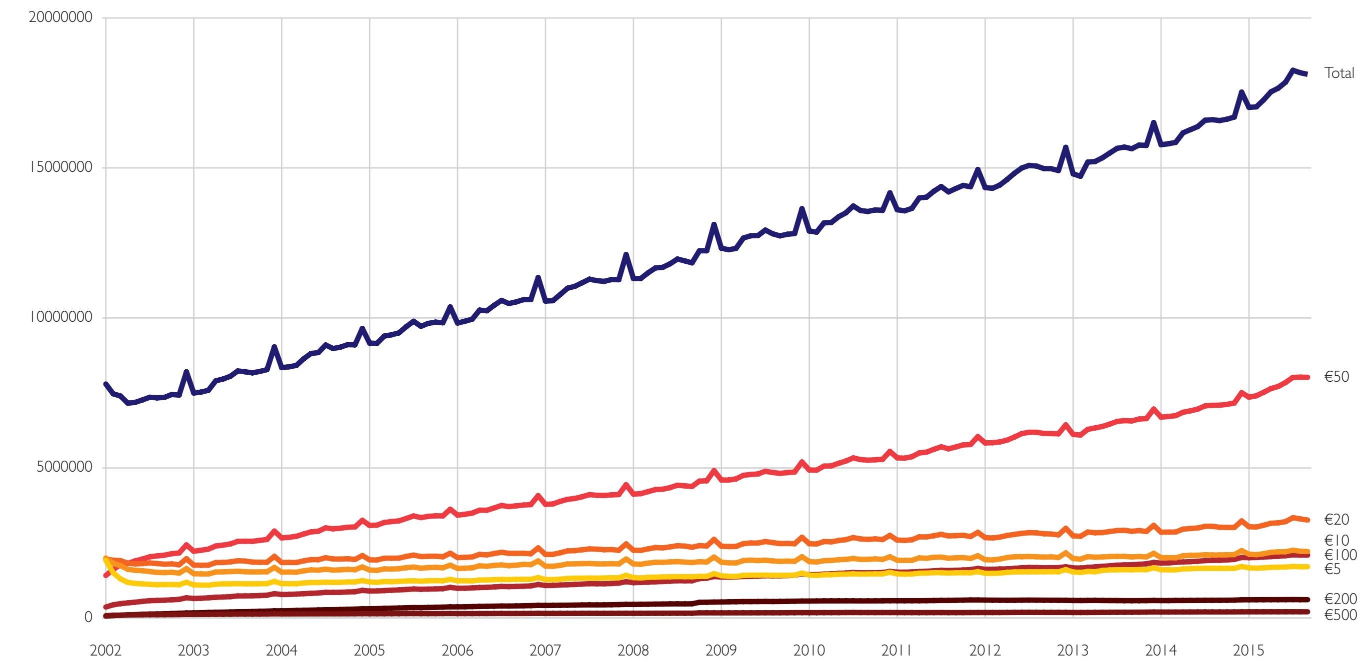
and

How will this develop in the future?

A related question is: how can we best organize cash logistics in order to provide the most efficient and reliable payment services to the European community? To discuss these questions we will first examine the current situation and list some notable key facts and figures of cash on a European level.

> *We are in favour of effective competition between payment methods and instruments, as we believe that ultimately this will lead to the most cost efficient and value adding payment instruments*
>
> Farid Aliyev
> BEUC

Figure 7 Cash in circulation (Quantity, Eur, per denomination, 2002 - 2015)



Source: ECB statistics

2.1 Cash in Europe – the current situation

2.1.1 Cash in Circulation

Cash in circulation (Euro) has grown steadily year on year since 2002 with 13%[12] per annum and 357% in total to exceed a total value of 1 billion since December 2014 (figure 8).

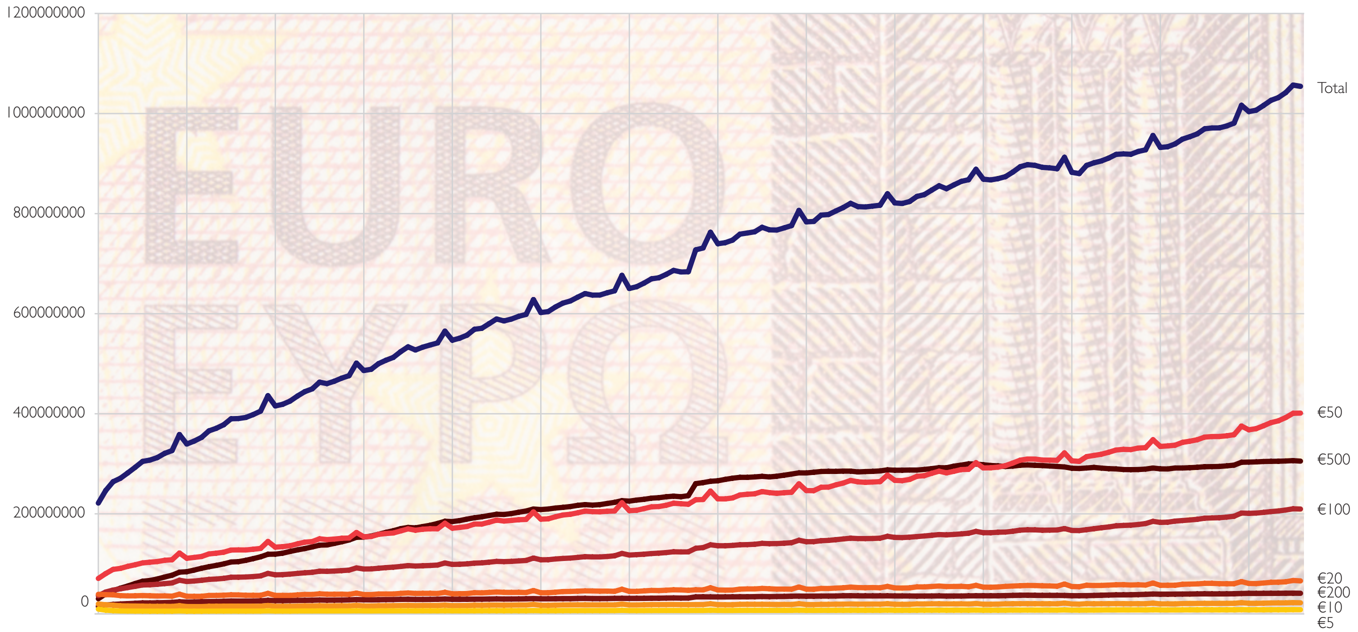
Besides the value of cash in circulation also the volume of cash notes in circulation has steadily increased since the introduction of the euro in 2002. This growth is notable across all denominations with the 50 and 100 euro notes contributing most.

Cash in circulation not only grows consistently in the euro area yet also in other major currency markets within the EU (e.g. UK), and outside the EU (e.g. US and Japan).

Since the start of the US recession in December 2007 and throughout the recovery, the value of

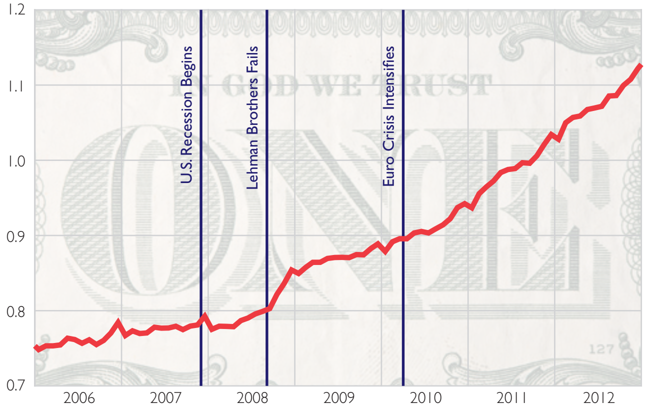
12 www.ecb.europa.eu/stats/euro/circulation/html/index.en.html#

Figure 8 Cash in circulation (Value, Eur, per denomination, 2002 - 2015)



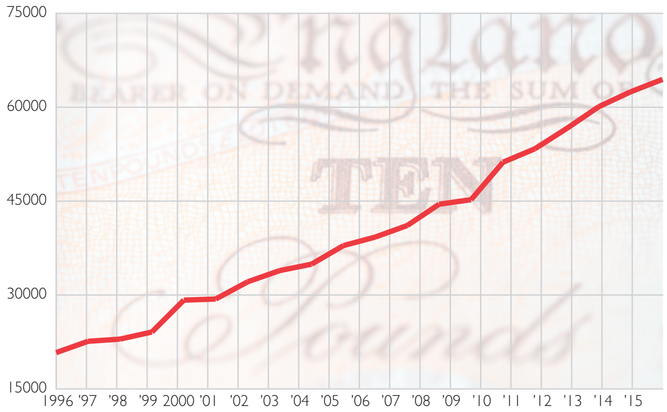
Source: ECB statistics

Figure 9 Currency in circulation (Value, USD, 2006 - 2012)



Source: Federal Reserve Bank of San Francisco 2012 Annual Report

Figure 10 Cash in circulation (x MIO GDB, Value, 1996 - 2015)



Source: Bank of England, statistics

US currency in circulation has risen dramatically[13]. And in the UK the amount of cash in circulation has steadily risen as well, with on average 11% per annum since 1996[14].

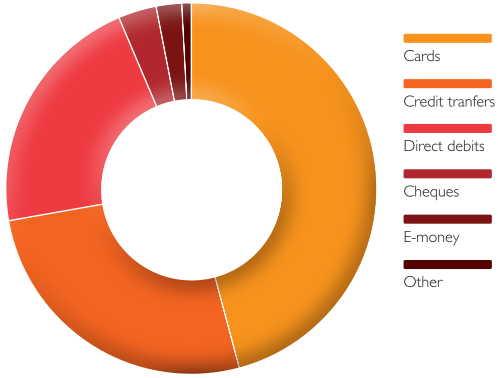
2.1.2 Cash vs non cash usage

Anonymity being one of the most significant attributes of cash, the exact number of cash transactions is very difficult to establish. Many cash transactions are not registered on an individual basis. The total volume of cash transaction can therefore only be estimated or deducted from other indicators. Furthermore, cash transaction volumes are not consistently measured and most reported numbers are likely to be lower than actual reality as for instance peer to peer transactions are mostly excluded.

Based on numbers published by the ECB[15] still around 60%[16] of all transactions[17] in the European Union are done with cash. These percentages vary widely across member states with 29% being the lowest (Luxembourg) and 97% the highest (Greece) (see chapter 3 for more detailed cross country comparisons).

It is difficult to say how the transaction volumes for cash are developing as cash transactions are not registered, yet based on key indicators, such as the amount of cash in circulation, number of ATM withdrawals and the average amount of an ATM withdrawal, an educated guess can be made. As the next paragraph will reveal these key indicators all show an upward trend (see figures 14, 15 and 16). From this, the assumption could be made that also the number of transactions performed with cash is steadily increasing.

Figure 11 Distribution of non-cash payment transactions (%, 2014)



Source: ECB statistics

2.1.3 Availability of Cash - Cash distribution Points

Cash is primarily made available to the general population through ATM's and bank branches. More recently, also retail-shops can bring cash

13 Federal Reserve Bank of San Francisco 2012 Annual Report

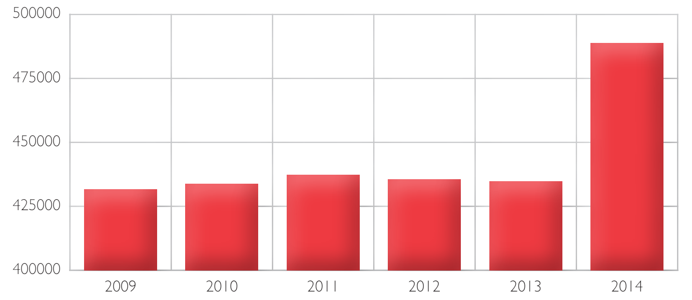
14 Bank of England, statistics

15 ECB statistics 2009-2013

16 G4S analysis: combining data from 2 public sources: ECB Occasional Paper series Nr 137: The Social and Private Cost of Retail Payment Instruments – a European Perspective, 2012 and ECB electronic payment statistics 2012 For example: According to the ECB, electronic transactions in Austria totalled 2,426.44 million transactions in 2012. According to the paper published by the ECB in Austria 52,52% of all transactions are done by cash. This would mean that the 2,426.44 is only 47,48% (100%-52,52%) of all transactions. From this follows that 2,426.44/47.48*100= 5,110.465 million total transactions of which 52.52% in cash. Percentages of non-cash instruments are calculated following the same logic.

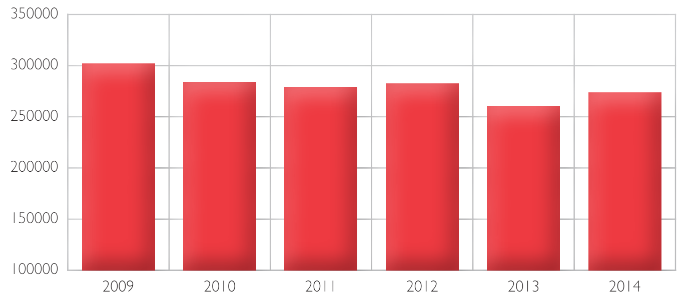
17 This includes b2c as well as b2b transactions. When limited to a consumer and retail environment (c2c and c2b), where cash is most commonly used, the percentage would be much higher.

Figure 12 Number of ATM's (EU28, 2009-2014)



Source: ECB statistics

Figure 13 Number of branches of MFIs offering payment services (2009-2014)

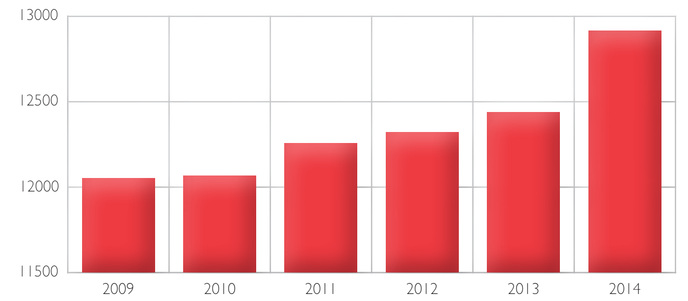


Source: ECB statistics

(back) into circulation if they have a recirculation facility within the shop's premises.
The number of ATMs across the EU28 has largely remained stable around 435.000 between 2009 and 2013[18] yet jumped to 488.880 in 2014 (figure 12). This significant increase can almost solely be attributed to France, which increased its ATM network with 56.000 ATMs (+95,9%) in 2014. Most other EU28 countries show a declining number of total ATMs. More on this in Chapter 3 on cross country differences and in the specific country page for France.

The number of local branches of MFIs offering payment services shows a downward trend since 2009. Between 2009 and 2014 the total number has declined from 302,308 to 274,007 (a total decline of 9,36%, figure 13). Remarkably, 2014 showed an increase from the previous year in the number of bank branches. It will be interesting to see whether this is just a incidental increase or that this marks a changing longer term trend.

Figure 14 Number of ATM withdrawals (Volume x Mio, 2009 - 2014)



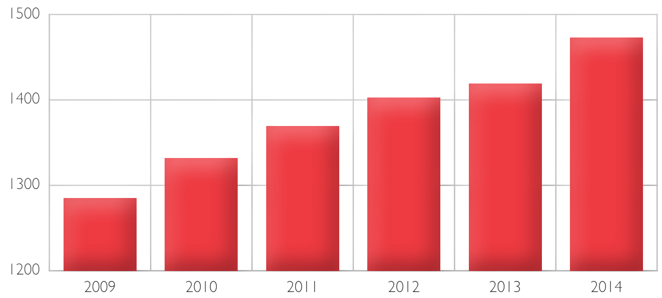
Source: ECB statistics

Overall, it can be concluded that for the EU28 in the past years access to cash via primary outlets such as ATMs and bank branches is being restricted. With regard to ATMs the exceptional position of France should be noted. Regarding the number of bank branches: the overall trend is still downward, yet the increase in 2014 is noteworthy.

The total number of withdrawals at ATMs has increased with 7,18% from 12 billion (2009) to 12.9 billion (2014) (figure 14). The total value of ATM

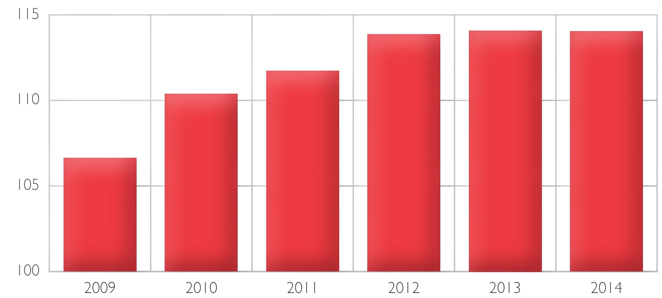
18 ECB statistics

Figure 15 Value of ATM withdrawals (x Bio euro, 2009 - 2014)



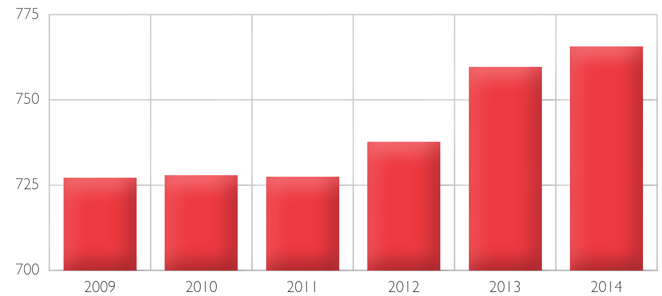
Source: ECB statistics

Figure 16 Average value per ATM withdrawal (Euro, 2009 - 2014)



Source: ECB statistics

Figure 17 Number of cards issued (x Mio, 2009 - 2014)



Source: ECB statistics

withdrawals has increased more significantly with 14.63% from 1,285 billion (2009) to 1,473 billion (2014) (figure 15). The average amount per ATM withdrawal has increased (with 6.95%) from 106,63 (2009) to 114,04 euro (2014), as shown in figure 16. However, the average amount per ATM transaction has largely remained stable since 2012.

It is most interesting to note that both cash in circulation (in value and volume and as share of total GDP) and the number of ATM withdrawals are increasing, indicating an increasing need for cash by the population, (even) while cash distribution points (ATMs and Bank Branches) show a declining trend.

One could wonder why any industry would actively limit access to a product, which is apparently in growing popular demand?

2.1.4 Alternatives to cash

In the retail environment the most prominent non-cash payment instrument is payment by card, which in Europe are mostly Debit Cards, followed by Credit Cards and Cards with a delayed debit function.

The total number of cards issued in the EU has increased since 2009 with 5,79% to 766 million in 2014[19] (figure 17), this represents1.5 cards per EU inhabitant.

These cards are mostly used for payment at Point of Sale (POS) terminals. The number of

19 ECB statistics

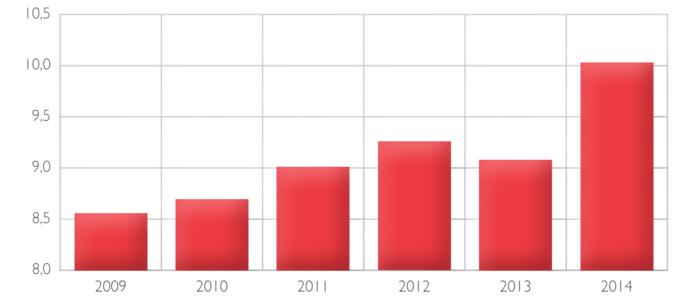
POS terminals in the EU has increased over the past years from 8.6 million in 2009 to 10.0 million in 2014[20] (figure 18). The upward trend seems to be restored after 2013 showed a decline in the total number of POS terminals in the EU.

As figure 19 shows, cards take the largest share in the electronic payment mix. The total volume of non-cash payments has increased to 103.2 Billion transactions; averaging a 4.3% growth rate per annum since 2009. In 2014 the volume increased with 2.7%.

In absolute terms, card transactions contributed most to this growth as their volume increased from 31.5 Billion in 2009 to 47.5 Billion in 2014, an increase of 50,5% over the period, or 8.4% on average per annum. Furthermore, with 46.0% in 2014 card transactions take the largest share of total non-cash payment transactions across the EU[21] (figure 19).

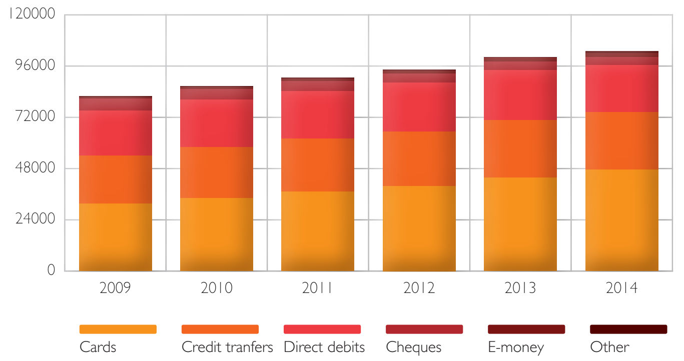
Most electronic alternatives to cash have grown in recent years and are expected to continue to grow in volume. As we have seen cards, credit transfers and direct debits account for 94% of all electronic payments in the EU28. The steep incline in the use of e-money purchase transactions is limited in absolute numbers and can predominantly be attributed to 3 countries: Luxembourg, Italy and Portugal. For Luxembourg, the strong growth in e-Money transactions can largely be attributed to the presence of Paypal, which is operating across the European Union as a Luxembourg-based bank since 2007. See also the section on cross-country comparisons and the country page for Luxembourg.

Figure 18 Number of POS (x Mio, 2009 - 2014)



Source: ECB statistics

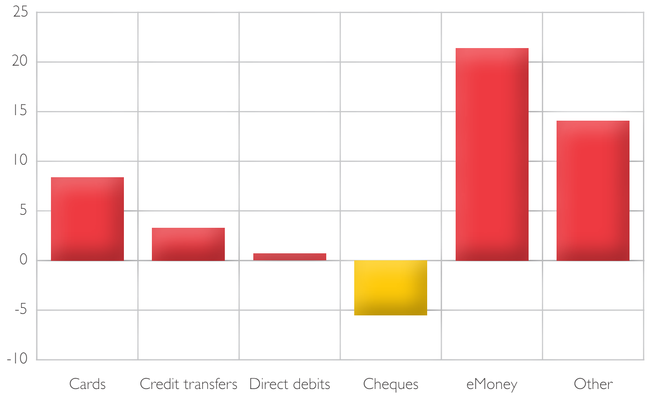
Figure 19 Non Cash payment mix EU28 (volume, x Mio, 2009 - 2014)



Source: ECB statistics

20 ECB statistics 2009-2014; NOTE: for 2014 ECB changed the composition of this statistic from POSs in a country to POSs provided by PSPs from a country (resident PSPs).
21 ECB statistics

Figure 20 Growth in alternatives to cash (average annual Growth Rate 2009-2014)



Source: ECB statistics

Alternative non-cash payments

More recently many alternative ways of non-cash payment have emerged, such as:

- e-banking schemes (such as iDeal in The Netherlands or GiroPay and Sofort in Germany and EPS in Austria, MyBank by EBA).
- Online payment schemes (such as Paypal)
- Mobile payments schemes, categorized in Mobile Contactless Payments, Mobile Remote Payments, M-Wallets, and mPOS initiatives across countries in Europe and globally[22])
- Virtual or crypto-currencies, – more than 530 crypto-currencies were available for trade in online markets as of January 2015 but only 10 of them had market capitalizations over 10 million dollar[23]. The most well-known crypto currency to date is Bitcoin.

22 www.europeanpaymentscouncil.eu/index.cfm/knowledge-bank/epc-documents/epc-overview-on-mobile-payments-initiatives-edition-december-2014/epc091-14-v20-epc-overview-on-mobile-payments-initiatives/

23 en.wikipedia.org/wiki/List_of_cryptocurrencies

There are some observations to be made with regards to these alternative payments:

- Many of the new schemes are building on the cards infrastructure and are re-using the existing cards framework.
- Many of the initiatives are domestic initiatives: posing a challenge for international (pan European) usage.
- Farid Aliyev, BEUC, underlines the concern for (a lack of) interoperability from a consumer's point of view: "We are in favour of effective competition between payment methods and instruments, as we believe that ultimately this will lead to the most cost efficient and value adding payment instruments. This is based on the principle of freedom of choice for consumers when it comes to selecting their payment methods. However, we are concerned about the interoperability, the security and privacy aspects of various payment instruments, including the innovative ones. Consumers take these for granted so we can't compromise on this in order to maintain trust in the payment infrastructure."
- EuroCommerce shares this concern: "Besides the additional cost for retailers to be able to accept all these different schemes, we need to make sure that all these schemes, suppliers and software work on the same hardware or terminal and they work with the same messaging protocols etc. This is a major issue, which is not yet resolved."

It is interesting to investigate how these developments in non-cash retail payment schemes influence the use of cash. Initial studies show that the rise in the number of electronic payment schemes has very little effect on the volume of cash transactions. Mostly the electronic payment means seem to compete for volumes with other electronic payment means[24].

2.1.5 Organisation of Cash Cycles across Europe

The number of NCB branches and the number of CIT companies per country are indicators for the setup of a country's cash cycle.

According to the most recent available data Europe has a total of 2,464 registered CIT companies[25]. Mathematically, this would translate into around 75 CIT companies on average per country, but in reality the distribution is very different. While most countries have 2 to 6 CIT companies, some countries have significantly more. For a more detailed overview of CIT companies per EU country, see 3.1.5.

In total, there are 225 National Bank branches across the Eurozone[26]. Again this total is not evenly distributed across all 19 countries. Most countries have 1 to 3 NCB branches, which could point to a more centralized approach to cash handling and/or reduced involvement of the NCB in operational cash handling activities. Some countries, like France with 73 (2014), still have significantly more NCB branches. For a full overview of the number of NCB branches per country, see 3.1.5.

24 ECB Working Paper Series no 1685/June 2014, Consumer Cash usage - a Cross-Country Comparison With Payment Diary Survey Data

25 Overview of Cash Logistics Industry, 2012, ESTA publication

26 ECB Statistics, note: on this topic the ECB only reports on NCBs that are part of the Eurosystem

2.2 Trends in Europe

There are some general trends to define in Europe, which are related to the financial sector.

2.2.1 Creation of a single Europe

The European political agenda for the current decade (2010-2020) is captured in the Europe2020 document. This strategic plan focuses on the further development of Europe and builds on its predecessor "the Lisbon Agenda" which described the plans and objectives for Europe for the 2000-2010 timeframe.

The Europe2020 agenda is based on 7 pillars:

1. Achieving the digital single market
2. Enhancing interoperability and standards
3. Strengthening online trust and security
4. Promoting fast and ultra fast Internet access for all
5. Investing in research and innovation
6. Promoting digital literacy, skills and inclusion
7. ICT-enabled benefits for EU society

Most current and on-going initiatives in the European financial sector in general and the payments landscape in particular find their origin in the ambitions put forward in the Lisbon Agenda.

Main objective of this plan was to create an integrated and harmonized Europe, with a single internal market without boundaries or obstacles inhibiting competition. This competitive market would drive us towards efficiency in the various market domains to the benefit of Europe as a whole and of its citizens.

Specifically for the payments market this larger agenda translated into the introduction of the euro itself, the introduction of the Payment Services Directive and SEPA. Even though much of the attention of the legislators and the financial sector went to the electronic payments means of credit transfer, direct debit and cards (Interchange fees!), the cash domain also saw some changes.

From a European perspective the most significant initiatives impacting the cash market are:

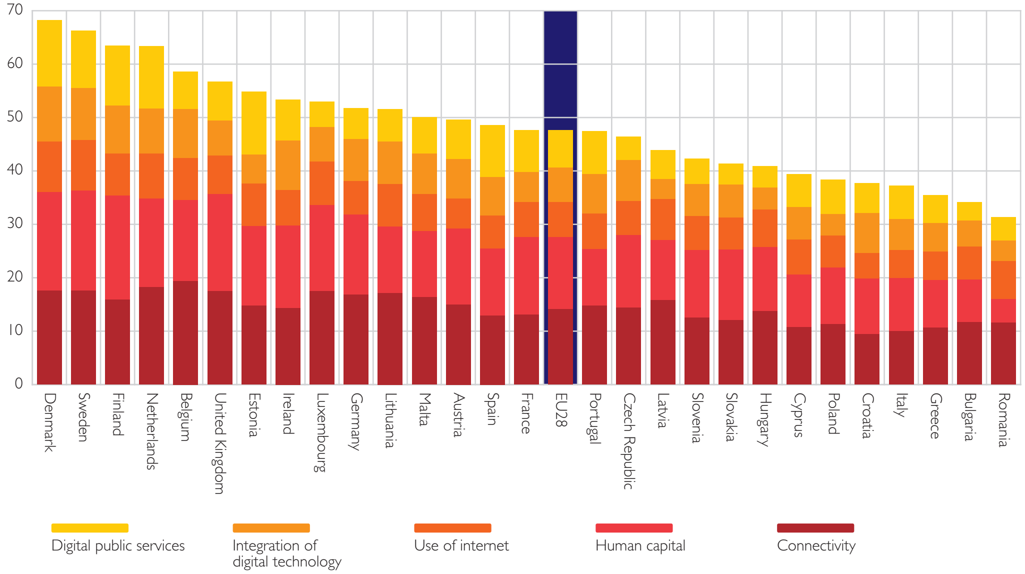
- The introduction of the euro as a single currency on 1 January 1999 and the physical issuing of euro banknotes and coins on 1 January 2002.
- Legislation for cross-border transport in 2011, including the use of IBNS (Intelligent Banknote Neutralisation System) as an additional security measure for CIT companies
- SECA, Single Euro Cash Area, an initiative started within the European Payments Council aiming to further integrate and optimize the European Cash market with improved cost efficiency at the top of their agenda. They issued the SECA Framework (2006) and have since then continuously engaged with all stakeholders to optimize cash handling and logistics across Europe.

These initiatives are driven by the continuous search for harmonisation and (cost-) efficiency in the market, while maintaining (or improving) the availability and service levels of cash payment services.

2.2.2 Digitalization

Digitalization is an undeniable trend and one of the 7 pillars of the Europe2020 agenda. Most of the attention goes to the standardisation,

Figure 21 Digital Agenda Scoreboard



Source: http://ec.europa.eu/digital-agenda/en/digital-agenda-scoreboard

interoperability between the member states and the reduction of cross-country differences and barriers. Obviously, also privacy is an increasingly important topic, with Big Data as a double-edged sword, promising consumer tailored services yet simultaneously raising privacy concerns. The European Commission periodically publishes a Digital Agenda Scoreboard[27] (figure 21).

Highlights from the most recent publication, which have relevance for the topic of cash payments, are:

- Internet users continue to increase, with 75% of the EU population reporting that they used the internet at least weekly in 2014;
- For most people, use of the internet is a daily activity, with 65% of EU citizens reporting using it daily in 2014;
- Use by disadvantaged people (individuals belonging to at least one of the three groups: 'aged 55-74', 'low education' or 'unemployed, inactive or retired') also continues to rise, with 60% reporting using the Internet at least weekly in 2014.
- As such, the Digital Agenda targets on Internet use have been met before their target date of 2015. However;
- 18% of the EU population still have never used the Internet. The main reasons for non-use are lack of interest, lack of skills and cost factors.

27 www.ec.europa.eu/digital-agenda/sites/digital-agenda/files/20150608-desi-2015a-main-rank.png

Cash is very important as it provides both social and financial inclusion

Farid Aliyev
BEUC

When looking at the Digital Agenda Scoreboard it is notable that the countries scoring higher on these criteria are mostly Northern and Western European countries (Scandinavia, Benelux and UK), followed by Southern and Central European countries. The tail end of this scoreboard is populated with predominantly Eastern European countries.

This is comparable to the geographical differences in payment usage as will become apparent in paragraph 3.2, which suggests a correlation between a country's digitalisation and payment habits.

This correlation and relevance can be intuitively explained in a number of ways:

1. The shift from cash to electronic (digital) payment instruments.
2. The shift from offline to online commerce, which will also impact the way consumers pay for goods and services.
3. The (potential) use of (personal) data by larger corporations, albeit banks, payment service providers, or new entrants such as Google, Apple, Amazon etc, is under scrutiny.

2.2.3 Social and Financial Inclusion

Social and Financial Inclusion is both on the agenda of the European Commission (Europe2020) and consumer organisation BEUC. Both organisations consider it to be very important that all European citizens have equal access to facilities that are regarded as essential in our modern society, such as: access to the Internet and (in the context of this report) access to the financial system; i.e. having a bank account and access to cash and non-cash payment instruments.

Farid Aliyev (BEUC) comments: "Cash is very important as it provides both social and financial inclusion. However, in today's society it is almost impossible to live without a bank account. To ensure financial inclusion we support the EU Directive on Payment Accounts[28], which includes the right to all consumers to have access to a bank account with basic features as of next year (2016). The directive states that besides access to a bank account itself, this also includes access to essential means of payment including a payment card."

Access to cash is primarily provided through ATMs and Bank branches and figures 11 and 12 show that both are declining. Especially in lower traffic, (mostly) rural, areas this decline is most notable. For the same reason, these areas are not commercially interesting for independent parties (IADs) to enter into, causing potential financial exclusion to cash in these areas.
Assuming the underlying need to make payments

28 Directive 2014/92/EU of the European Parliament and of the Council, 23 July 2014, on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features

remains constant, this might lead to an increase in the use of alternative (innovative) payment methods in these areas.

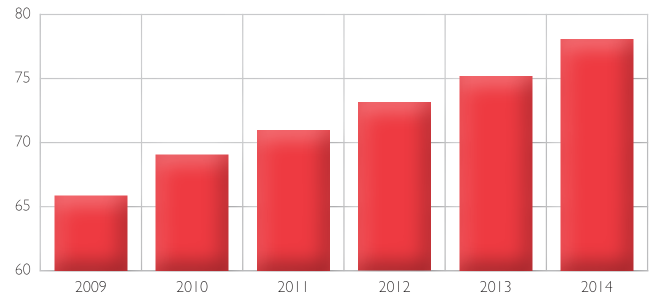
For access to electronic payments, it is reported that for the EU28 as a whole 86%[29] of the population (age >15) holds at least one bank account at a formal Financial Institution. The EC reports also that on Use of Internet and Integration of Digital Technology (including e-Commerce, cloud and online services) just over 78% of the European population has access to the Internet (figure 22), more than half (57%) of EU Internet users use online banking and close to two-thirds (63%) are shopping online.

The European Commission concludes that most of their initial targets have been reached to date and that it is now time to focus on the lifting of digital borders between member states.

Use of online banking has increased impressively and steadily since 2009 with 5.21%[30] per annum to a total of 44% in 2014 (figure 23). For those who had used the Internet within the last 3 months this percentage is even higher: 57%.

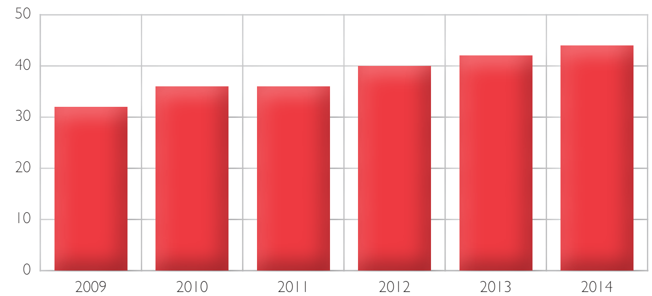
These numbers and developments are relevant as payments are considered an essential facility in our society and access to the financial system in many ways serves a utility function. Having a bank

Figure 22 Internet penetration (% of EU28 population)



Source: World Bank

Figure 23 Use of online banking (EU, 2009-2014)



Source: www.statista.com

29 www.ec.europa.eu/digital-agenda/en/news/digital-agenda-scoreboard-2015-most-targets-reached-time-has-come-lift-digital-borders

30 www.ec.europa.eu/digital-agenda/en/news/digital-agenda-scoreboard-2015-most-targets-reached-time-has-come-lift-digital-borders

account, having access to Internet and additionally also to online banking are all indicators to measure a country's financial inclusion to the electronic payments infrastructure.

The results show that even though the numbers for access to electronic payment facilities are increasing, cash is still indispensable to fully include all European citizens in the day-to-day payment infrastructure. Cash, in that sense, is still the benchmark.

Cash can be used and is accepted everywhere, as it doesn't require a complex infrastructure between consumers and retailers. See also Key attributes of cash and key themes such as Availability and Reliability, which will be discussed in paragraph 2.3.

In Chapter 3 we will see that there are significant cross-country differences between EU member states in these categories.

2.2.4 Innovation and new entrants

Innovation is one of the cornerstones for the future European society according to the Europe2020 Agenda. For (cash) payments this can be translated into innovation in payment products and innovation in the way the (cash) payments market is organised.

Innovation in payment products

Even though innovation in payment products predominantly takes place in the electronic payment domain, these innovations do have a potential impact on the use of cash, as more and more alternatives become available to the general public. Examples of such product innovations are: Internet payments, mobile payments, the increased use of Near Field Communication (NFC) technology, virtual currencies etc.

New entrants active in this domain are mostly global companies like Apple, Google, Amazon, Microsoft, Paypal, etc. Yet also incumbent players (mostly banks) are active in this domain, for example through the development of an international Internet payment scheme or the recent initiative to provide instant payments. See 2.4.1 for more on these innovative developments.

When it comes to cash as a payment instrument, continuous innovation is also paramount, for instance when it comes to:

- Production of cash (notes and coins): euro banknotes are printed on pure cotton-fibre paper, which gives them their special crispness and resists wear better than regular paper.
- Security features to prevent counterfeiting: Certain security features, such as watermarks and embedded threads, form part of the paper itself[31].

Innovation in (cash) payment market organisation

Besides reorganising the cash cycle to further optimize cash logistics by introducing cash management solutions for recycling, new legislation also allows new entrants to enter the market or existing players to redefine their role within the market. This innovation leads to stirring up the market in order to increase competition and improving efficiency in this space.

The (original) Payment Services Directive already allowed for Payment Institutions and the PSD2 brings the possibility of becoming a Third Party Payment Service Providers (TPP's), effectively changing the payment status of a company and allowing this company to perform other or more activities on the payments value chain. CIT companies across the EU are looking at these possibilities closely, or have even already obtained a PI license[32].

In general, the creation of a single market and removal of barriers between member states effectively increases the attractiveness of the European market for new entrants. This is facilitated by the regulation, which also provides opportunities for existing players to reposition themselves on the cash logistics value chain. Innovations on product level as well as on cash logistics (market organisation) level only further increase the dynamics in the cash market.

These are general trends and it will be very interesting to see if/how these trends impact the use of cash and the organisation of cash logistics in Europe in years to come.

31 www.new-euro-banknotes.eu/Euro-Banknote/production

32 France, Brinks (2014).

2.3 Developments in Cash in Europe

Based on data analyses and stakeholder interviews we identified a number of developments in the European cash market. First we examine the developments for cash as a payment instrument and secondly we have a further look at the developments in the organisation of cash logistics.

2.3.1 Cash as payment instrument

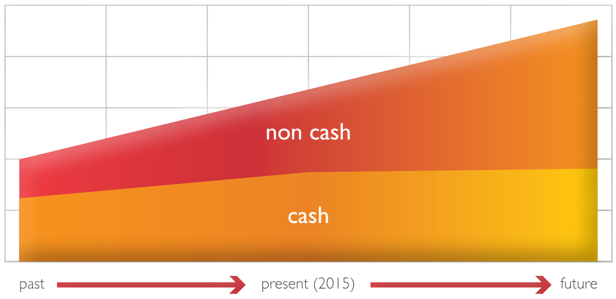
Cash is still and by far the most used payment instrument in a retail or person-to-person environment in Europe. Cash, moreover remains as the benchmark against which all other means of payment are measured, primarily because of the high availability of cash and the fact that it is a public good.

Furthermore, the number of cash transactions is still growing, however, electronic transaction volumes are growing faster resulting in a reducing share of cash in the overall transaction volume. Figure 24 shows a simplified representation of the development of payment volumes for both cash and non-cash payments.

A number of observations can be made:

1 Transaction volumes for both cash and non-cash payments steadily increase Year on Year
2 Cash transaction volumes grow
3 Non-cash transaction volumes grow
4 Non-cash transaction volumes grow faster than cash transaction volumes, resulting in a reducing share of cash transactions in the total volume.

Figure 24 Development of payment volumes, cash and non cash



Source: G4S and Payment Advisory Group, 2016

From this we can conclude:

1 Based on transaction volumes, payments is a growing market for non-cash as well as cash
2 A trend towards electronic payments is clearly present

It will be interesting to see whether this trend will continue in the future and whether (and if so, when!) we'll reach a 'tipping point' at which the share of cash payments will be so marginal that the move towards a Cashless Society almost comes naturally.

Some caveats need to be made with this representation. First, the number of cash transactions is very difficult to establish, let alone the development over time of these volumes. There is little research available which includes (f)actual numbers over time, on a Pan European level including all segments. Given this lack of hard data, we have tried to deduct the development of cash transaction volumes from other indicators such as:

1 Cash in circulation, both in value and number of notes and coins
2 Number of ATM withdrawals
3 Average value of ATM withdrawals

Based on these indicators, a decline in cash transactions volumes cannot be concluded, as this data seems to suggest an increase in the number of cash transactions. However, formally also this conclusion cannot be drawn based on this data.

Also, the future development of (cash and non-cash) transaction volumes is hard to predict, as many different factors are influencing this development. For more on future developments in cash usage, please see Chapter 4 on Future Scenarios.

Even without hard evidence the common consensus seems to be that, at least relatively, cash is losing ground. A number of developments influence this trend away from cash towards electronic payment methods.

Promoting electronic payments

Promoting electronic payments, primarily cards, can be done by taking away the disadvantages of cards payments and further improving the advantages.

- Reducing the cost of these transactions and increasing the transparency of the underlying cost structure of card payments by reducing the Interchange Fees.
- Increasing the speed and convenience of a non-cash transaction at the POS, through NFC technology (tap & go), no PIN required for smaller amounts)

Other innovations under discussion are the introduction of an Instant Payments scheme across Europe, ensuring "direct" settlement of funds onto the retailers account. Currently a number of initiatives are on-going globally and in Europe, in various stages of maturity: South Africa (RTC, 2006), Canada, Mexico (SPEI), Singapore (FAST, 2014), Australia (planned for 2016). Focusing on Europe, many solutions – among which the following – are reported especially outside the Euro area and in northern and eastern countries. Denmark, Poland (Express ELIXIR system, 2012 and BlueCash system, 2012), UK (Faster Payments, 2008), Sweden[33] (BiR, 2008/2009). Furthermore initiatives have started to deliver instant payments in various other countries as well, such as The Netherlands, Finland and Norway[34].

Most notable is the Faster Payments scheme in the UK, which has been operational since May 2008[35] and has since grown to process over 3 billion transactions in the UK (GBP), In 2014 Faster Payments represented 14.72% of the total UK electronic payments volume and the volume grew with 14% from 968 million (2013) to 1.1 billion (2014)[36].

33 www.ecb.europa.eu/paym/retpaym/shared/pdf/2nd_eprb_meeting_item6.pdf?b70bbb40c47214b15692369b71765d2b
34 www.europeanpaymentscouncil.eu/index.cfm/knowledge-bank/epc-documents/epc-report-on-instant-payments-submitted-to-the-june-2015-meeting-of-the-euro-retail-payments-board/epc160-15-epc-report-to-the-erpb-on-instant-paymentspdf/)
35 www.fasterpayments.org.uk/about-us/historytimeline
36 http://www.fasterpayments.org.uk/sites/default/files/annual_summary_of_payment_statistics_2014_ccccc.pdf

Other instant payment initiatives have been started in various other countries. Also the ECB, the EC and the EPC are looking at this topic from a European perspective to ensure the service will be available in a standardised and harmonized way across Europe and to avoid fragmentation.

Limitations on the use of cash

There are developments for the limitation of using cash like limiting access to cash. As we've already established earlier, the number of primary access points for cash (ATMs and Bank branches) are significantly reduced across the EU. Another limitation is putting a price on cash, by e.g. charging for ATM withdrawals, and limiting the use of cash.

Farid Aliyev, BEUC, strongly opposes this development: "As a matter of principle we find this unacceptable. We are forced to use a bank account and to have our salaries deposited on a bank account. But then we are charged to access our own money. This is unacceptable."

In addition to charges for ATM withdrawals, certain member states have capped the amount you're allowed to pay in cash in that country. This is mainly done as a counter measure to black market transactions and the height of the amount is still well above the usual cash transaction, yet the caps are coming down and it does limit the use of cash. Thierry Lebeaux, ESTA, adds: "We understand that we need to fight against criminality, yet we should not confuse the reason for criminality with the medium of cash. I agree with those who say that limitation on cash payment is more a "reflection of the inability to address a problem, than a solution or a remedy to the problem".

From an EU perspective it is apparent that there are differences per country regarding these limitations. We refer to the chapter on cross-country comparisons for a full overview of these restrictions per EU-member state.

Changing context of buying of goods & services

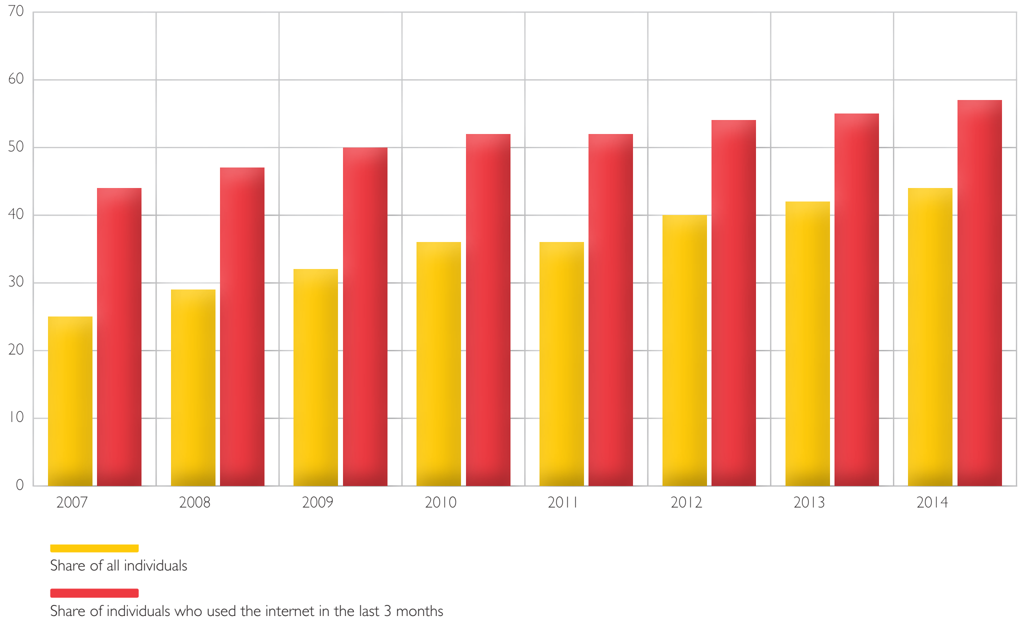
A payment transaction is not a stand-alone activity. It usually concludes another transaction, an exchange of goods or services provided from one party (company, individual) to another party (company/individual). When it comes to retail payments the social context is clearly shifting. Most notably, we see a shift from an offline or face-to-face environment to an online environment.

With the advent of Internet and related technologies European consumers are buying more and more of their goods and services in an online environment. This impacts the way these goods and services are paid for.

As seen in chapter 2.2, internet use continues to grow across Europe, as does the sales through online commerce or e-commerce. The size of the EU28 e-commerce industry in 2013 is 317.9 Billion[37], which is 14.7 % higher than in 2012 (277.16 Billion). The share of E-commerce in EU GDP is 2.2 % for 2013.

37 www.ecommercenews.eu/ecommerce-sales-europe-will-increase-18-4-2015

Figure 25 Share of all individuals versus individuals who used Internet



Source: www.statista.com

Across the EU, the top e-commerce countries (in EUR Millions) are:

- UK: 107.2 Million
- Germany: 63.4 Million
- France: 51.1 Million
- Austria: 11.0 Million
- Netherlands: 10.6 Million

Moreover, the share of online commerce in total retail sales in Europe is 7.2% in 2014, up from 6.2% in 2013 and its growth is expected to continue to 8.4% in 2015. These predictions come from RetailMeNot, which analysed the European ecommerce industry together with the Centre for Retail Research.

Access to Online Banking

As stated before in the section on Social and Financial inclusion, recent studies show that 44%[38] of all individuals within the EU used the Internet for online banking. Usage was even higher (57%) among those who had used the Internet within the last three months (Figure 25). This study also showed that the use of online banking in Europe was highest in Iceland (91%), see also cross-country comparisons in Chapter 3.

38 www.statista.com, 2015

Laws & Regulations
The legal status of cash is that it is a legal tender. Legal tender[39] is a medium of payment recognized by a legal system to be valid for meeting a financial obligation. Paper currency and coins are common forms of legal tender in many countries. Legal tender is variously defined in different jurisdictions. Formally, it is anything which when offered in payment extinguishes the debt. Thus, personal cheques, credit cards, debit cards, and similar non-cash methods of payment are not usually legal tender. The law does not relieve the debt obligation until payment is tendered.

Recently, the status of cash as legal tender has become topic of discussion again, with an increasing number of retail businesses (for instance in The Netherlands and Denmark) 'banning' cash from their shops and only accepting electronic payment instruments.

The EC and the ECB seem to allow this under the label of 'contractual freedom'. In Denmark an official proposal went to vote to allow Danish shopkeepers to decide whether or not to accept cash in their shops. This proposal was not accepted by Danish parliament (July 2015).

Payment Services Directive (I & II)
The Payment Services Directive (PSD, 2007) provides the legal foundation for the creation of a single market for payments across the European Union. The revised directive, known as PSD2, has been adopted by the European Parliament in October 2015. Once the Directive is published the Official Journal of the EU, member states will have two years to introduce the necessary changes in their national laws in order to comply with the new rules.

This new law enhances consumer protection, promotes innovation and improves the security of payment services.

Highlights of a PSD2 are[40]:

- Introduction of strict security requirements for the initiation and processing of electronic payments and the protection of consumers' financial data;
- Opening the EU payment market for companies offering consumer or business-oriented payment services based on the access to information about the payment account – the so called "payment initiation services providers" and "account information services providers";
- Enhancing consumers' rights in numerous areas, including reducing the liability for non-authorised payments, introducing an unconditional ("no questions asked") refund right for direct debits in euro;
- Prohibition of surcharging (additional charges for the right to pay e.g. with a card) whether the payment instrument is used in shops or online.

Especially the enhanced consumer protection is welcomed by BEUC: "Being a consumer is a full time job, yet we can't expect every consumer to

39 https://en.wikipedia.org/wiki/Legal_tender

40 http://europa.eu/rapid/press-release_IP-15-5792_en.htm?locale=en; Full text of the Revised Directive: http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+REPORT+A8-2015-0266+0+DOC+XML+V0//EN

be an expert in fraud and hi-tech risk security. That's why we are happy that the PSD2 states that the burden of proof is on the provider in case of a fraudulent transaction. However, the notion of 'gross negligence' has still not been clarified."

x-Border Cash in Transit

The regulation (EU) No 1214/2011 of the European Parliament and of the Council[41] (16 November 2011) on the professional cross-border transport of euro cash by road (cash in transit – CIT) between euro-area Member States is entered into force on 30 November 2012.

The purpose of the Regulation is to ensure that euro banknotes and coins can be easily and safely transported by road across national borders between Member States that have adopted the euro or are about to do so.

Since its introduction in 2011 only a limited number of CIT companies have acquired the license (21 in 2015[42]), sparking the debate whether the regulation is not fit for purpose or whether there's no purpose for the regulation. In our interviews, all stakeholders except the European Payments Council, seem to agree that presently there is no need or business case for further cross border integration of CIT services.

Thierry Lebeaux, ESTA, explains: "Before drafting or changing a regulation you need to do an assessment on the need for the regulation. And apparently there is very limited need for cross-border CIT and changing the regulation will not change that." EuroCommerce shares this position and states: "improving the possibilities for cross border CIT is not an issue for retailers in Europe."

Improving the possibilities for cross border CIT is not an issue for retailers in Europe

EuroCommerce

The EPC has a different view: "The current cross-border regulation for CITs is not sufficient, as it doesn't stimulate enough an open market for CIT companies in Europe. The main point is that an integrated Europe will lead to more competitive and efficient markets, including the CIT market."

SEPA/SECA

The creation of a Single Euro Payments Area (SEPA) has long been awaited, but has gone to live with the passing of the so-called end date of September 2014. After that date it was no longer allowed to submit (electronic) payment transactions that did not meet the new European standards.

41 ec.europa.eu/economy_finance/euro/cash/transport/index_en.htm

42 Presentation EC, Rüdiger Voss, ESTA conference, Berlin 2015

The non-electronic counterpart of this initiative is called Single Euro Cash Area, or SECA. Even though many claim that this area already exists and the mission was already accomplished with the introduction of a single currency in 2002, the European Payments Council, in close cooperation with other stakeholders continue their efforts to further integrate Europe when it comes to cash usage and cash logistics.

According to the EPC the objective of SECA is to create, within the Eurosystem, a level playing field where the basic cash functions performed by each of the NCBs in the euro area are interchangeable, e.g. there is a common level of service and common processes are followed by all euro area NCBs[43].

Leonor Machado, EPC, adds: "The EPC Cash Efficiency Working Group is working with all stakeholders to promote the most cost efficient way to organise cash handling and cash logistics in Europe".

Local regulation

Additionally there are many domestic laws and regulations underlining the observation that Europe is still a fragmented environment when it comes to the use of cash and cash handling. See the chapter on Cross-country comparisons" and the "Country pages" for specifics per country on this topic.

2.3.2 Scoring of Payment Instruments on key attributes of payments – Cash & Non-Cash

A number of conclusions can be drawn from this analysis:

- Each payment instrument seems to have its own value
- Both cash and non-cash payment instruments fulfil unique needs, and as long as these needs do not change, both types of payment instrument are required to fulfil the full spectrum of user's needs.
- Non-cash payment methods seem to overlap more, with some attributes covered by multiple non-cash payment instruments, while cash uniquely covers other attributes. This suggests that competition exists mostly within non-cash payment instruments (potentially leading to cannibalisation, or fragmentation), while cash payments remain largely unaffected.
- Therefore it can be expected that as long as these attributes (valued assets) are only fulfilled by cash and not by any other alternative, cash will fulfil a need and therefore will remain a widely used payment instrument.
- From a user's perspective you could argue there shouldn't be any competition between cash versus non-cash, nor should it be an either/or proposition. There is just a need to make payments in all circumstances and this need is fully fulfilled by both cash and non-cash payment instruments.

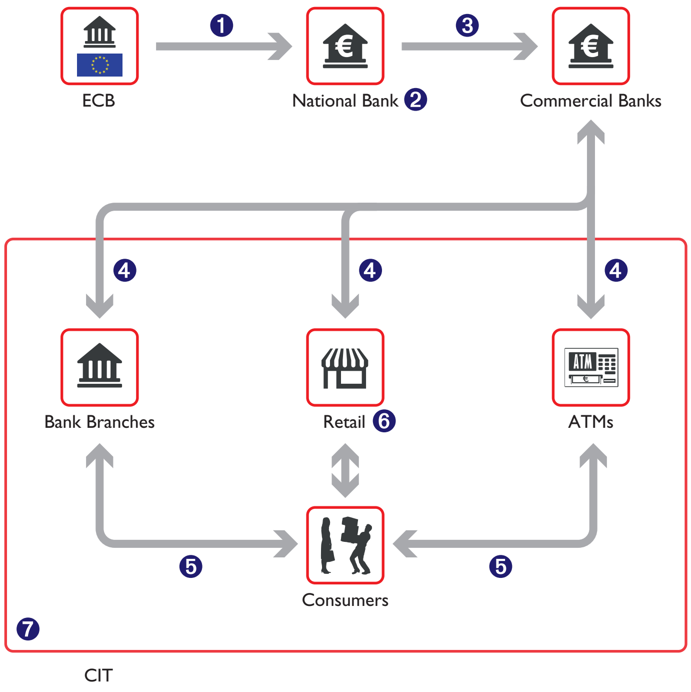
43 www.europeanpaymentscouncil.eu/index.cfm/sepa-for-cash/

Figure 26 Scoring of payment instruments on key attributes of payments

	Anonymous	Legal tender	Secure	Safe haven/Fall back	Direct	Tangible/Budgeting	Remote payment	Higher value payment (>€5000)	Availability	Reliability	Efficient	Safe	Convenience
Cash	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	±	±	✓
Cards	✗	✗	±	✗	✗	✗	✓	✓	±	±	✓	✓	✓
Debit card	✗	✗	±	✗	✗	✗	±	±	±	±	✓	±	✓
Credit card	✗	✗	±	✗	✗	✗	✓	✓	±	±	±	±	✓
Pre paid card	✓	✗	±	✗	✗	✗	±	✗	±	±	±	±	✓
Credit transfer	✗	✗	±	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓
Direct debit	✗	✗	±	✗	✗	✗	✓	✓	±	±	✓	±	±
Cheques	±	✗	✗	✗	✗	✗	✗	✗	±	±	✗	✗	✗
Mobile	✗	✗	±	✗	✗	✗	✓	✗	✗	±	±	±	✓
Internet	✗	✗	±	✗	✗	✗	✓	✓	✗	✓	±	✓	✓
Virtual currency	✗	✗	✗	±	±	✗	✓	✗	✗	±	±	✗	±
Instant payments	✗	✗	±	✗	✓	✗	✓	✓	±	±	±	✓	✓

G4S and Payments Advisory Group Analysis, 2016. Comment: it is understood that listed payment instruments are not mutually exclusive. Scores between brackets indicate that the score is a future projection, as the product is not yet widely adopted in Europe (e.g. Instant Payments).
Source: G4S and Payments Advisory Group analysis, 2016

Figure 27 The Cash Cycle



Source: G4S

2.3.3 Organising cash logistics - the Cash Cycle

Since cash still has a very prominent place in our society and from the point of view of Efficiency and Reliability the industry is continuously looking for ways to optimize the cash logistics process. This process is also called the Cash Cycle. The base activities in the Cash Cycle are:

1. Every year the ECB determines, together with the NCBs, how many banknotes are needed to meet public demand and replace unfit banknotes.
2. The NCB's then produce these banknotes under strict quality regulation
3. The notes are then transported to commercial banks which order the notes from the NCBs
4. The banks issue the notes into the public domain through cash distribution points, predominantly through ATMs or bank branches.
5. The cash notes are then used to buy goods or services
6. Retailers receive notes and checks whether the note is genuine and fit for recirculation
7. The banknotes now circulate between consumers, retailers and banks
8. Suspected unfit banknotes are returned to the NCB and after unfitness is confirmed by the NCB these notes are destroyed and replaced
9. Fit banknotes are re-circulated

Even though the basic activities in a cash cycle are largely similar across countries, there are differences per country. Differences exist in who does what in the cash cycle and (related) how the cash logistics market is organised.

The roles of the interviewed stakeholders in the cash cycle are:

- European Commission: Regulator (right to propose relevant EU legislation)
- European Central Bank: The ECB and the national central banks (NCBs) of the Eurosystem are committed to supporting cash as a generally available, easy-to-use, reliable and efficient means of payment for retail transactions. We monitor and continuously seek to promote the safety, resilience and efficiency of the cash cycle.
- European Payment Council: Banks provide payment services and cash through bank branch and ATM network

- EuroCommerce: Retailers use and accept cash. They also perform fitness and counterfeit checking and take part in the recirculation of cash
- BEUC: Consumer, user of cash
- ESTA: Provider of cash logistics and cash management services

As the ECB lists on their website, the organisation of the cash supply chain varies from country to country and depends on, e.g.
- the structure of the local central bank, including its branch network,
- the banks and their branch networks,
- the legal regime,
- the payment habits of the public,
- the infrastructure of cash-in-transit companies operating on the market,
- and finally the geography of each country, its history and traditions.

For these reasons, a "one-size-fits-all" model to organise the national cash cycles in the euro area is not feasible.

Despite these differences, the Eurosystem continues to aim for a greater convergence of the cash services offered by euro area central banks. Also the EPC recognizes that the organisation of the cash cycle is an important factor in determining the level of cost efficiency in cash logistics, yet the EPC also agrees that there is no single, ideal model suitable for all countries.

Leonor Machado, EPC, elaborates: "Our intention is to show the possible options for organizing the cash cycles. Countries can then reflect on this and find the best possible cash cycle organization for their specific situation. Asking themselves: Are we doing the best that we possibly can, or can we further improve efficiency in our cash cycle organization?"

When examining these models, a general trend seems to be that the NCBs are retracting from operational activity in the cash cycle, leaving the execution of these activities to commercial market parties (commercial banks, CIT/CMCs, and other PSPs).

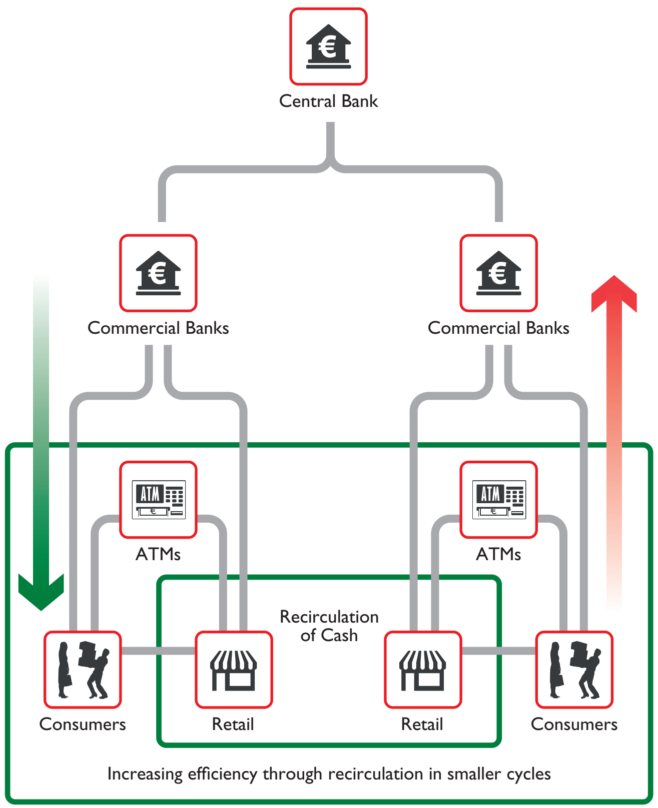
From CIT to CMC

CIT companies anticipate future developments by transforming from classic Cash in Transit Companies to Cash Management Companies (CMC's). These companies not only signal an ambition to take on more activities in the cash cycle, but also to become more actively involved in the liquidity and cash management on behalf of their clients. The latter move is supported by legislation (PSD and PSD2) which allows companies to obtain PI or TPP status, as already mentioned in 2.4.1).

Another general trend seems to be that the recirculation of cash is done more and more at the level of retailers/consumers, as depicted in Figure 28. This obviously varies per country and depends largely on the organization of each country's cash cycle.

The green arrow on the left indicates that operational services are pushed "down" into the cycle. At this lower end more and more recirculation of cash takes place, through increasingly sophisticated practices in cash logistics. Furthermore this recirculation takes place in increasingly smaller cycles (sometimes even within the premises of a single store). Both of these increase the efficiency in the cash cycle. Consequently, less cash is then transported back "up" into the cycle as visualized by the smaller red arrow on the right.

Figure 28 The Cash Cycle



Source: G4S

2.4 Cash in Europe – initial observations

When observing all these developments we distinguish between the use of cash, as a payment instrument, and the organisation of cash in the cash cycle.

2.4.1 Cash as a Payment Instrument - observations

1 With the introduction of the euro as the single currency for (now) 19 countries a significant step has been taken to the integration of Europe when it comes to cash as a payment instrument.
2 Cash is still the most widely used and available payment instrument across the EU28, accounting for 60% of all payment transactions; for retail payments this % is expected to be even higher.
3 Cash in Circulation is growing consistently both in value and volume, in euros as well as in any currency and major economy, indicating a growth in the need and use of cash. The value of euro cash in circulation has grown with 13% on average since 2002.
4 Cash is used primarily for hoarding (2/3) and secondary for transactions (1/3) according to ECB estimates.
5 Cash transaction volumes, even though hard to measure exactly, are growing as well based on the increasing volume of cash in

circulation (+13,0%), the number of ATM withdrawals (+1,2%) and the total value of ATM withdrawals (+2,4%).

6 Electronic transactions seem to be growing at an average of 4.3% per annum (2009-2014) and with 2.7% in 2014 compared to the previous year.

7 Growth of electronic payment transaction seems to outpace the growth in cash transaction volumes resulting in a declining share of cash transactions in the total payment mix.

8 Number of (predominantly electronic) payment instruments available to consumers is increasing. This may lead to fragmentation and inefficiency, as retailers "have" to accept many different instruments including the associated cost.

9 New electronic payment instruments seem to be cannibalising other electronic payment instruments, rather than cash.

10 Regarding access to cash via primary outlets such as ATMs and bank branches: it can be concluded that for the EU28 in the past years access to cash via primary outlets such as ATMs and bank branches is being restricted. With regard to ATMs the exceptional position of France should be noted. Regarding the number of bank branches: the overall trend is still downward, yet the increase in 2014 is noteworthy.

11 Restrictions on the use of cash (limits in amount and charges for access to cash) are in place in a number of EU countries.

12 There seems to be a mismatch in the need for cash, which is increasing, (based on cash in circulation and ATM withdrawals which are both increasing) and the supply of or access to cash, which is being restricted, see also 2.2.3 on Financial and Social Inclusion.

13 Logically when demand exceeds supply a market opportunity is created. With banks retracting, other commercial parties enter into this space, such as Independent ATM Deployers (IADs).

14 On the cost of (cash) payments: the costs for both cash and non-cash payment transactions are mainly fixed. Disproportionate promotion of one product over the other does not directly lead to a reduction in the accumulated cost for cash and non-cash payments. As long as one of the products is not completely abolished, both the (high) fixed cost components remain, and therefore a 'healthy' mix of cash and non-cash payments appears to be best.

15 Promotion of electronic payments over cash payments might not necessarily lead to a reduction of cost for banks, yet is does lead to an increase in bank revenue (or increase in cost to banks' clients).

16 Analysis shows that both cash and non-cash payment instruments fulfil unique needs, and as long as these needs do not change both types of payment instrument are required to fulfil the full spectrum of user's needs.

17 Sentiment seems to move away from "war on cash" and drive towards a "cashless society" to a more open viewpoint: "The world cannot do without cash"; leading to a more balanced debate on how to best organise payments in general (both electronic and cash payments included) to the benefit of our society.

18 From a user's perspective one could argue there shouldn't be any competition between cash versus non-cash, nor should it be an either/or proposition. There is just a need to make payments in all circumstances and this need is fully fulfilled by both cash and non-cash payment instruments.

2.4.2 Organising Cash Logistics – cash cycle

Also when it comes to organising cash logistics in Europe a number of observations can be made:

1 The market for cash logistics in Europe is fragmented – there is no single European market when it comes to cash logistics (in terms of roles and responsibilities of cash cycle participants, such as Central Banks, Commercial Banks, CITs and Retailers).

2 Some legislation has been passed in order to further integrate Europe (regulation on cross-border CIT), yet this has not been met with much enthusiasm and the necessity of this regulation is debated. No further regulation to push for European integration is expected, in the absence of a clear business case and market demand.

3 Currently there is no major need felt amongst most stakeholders to further integrate and harmonize cash logistics in Europe.

4 Even though the activities performed within the cash cycle are largely similar, and the objectives for organising cash logistics are the same (efficiency, reliability, safety) there are many variances in which cash logistics is organised across the EU28.

5 There is no one size fits all approach for optimal cash cycle organisation. Optimal cash cycle depends on many country specific

factors, such as: culture, geographical aspects, regulation etc.

6 (Partial) Shift in oversight from NCBs to ECB under the Single Supervisory Mechanism, leading to European guidelines with local implementation and execution.

7 An overall trend seems to be that NCBs are withdrawing from active participation in cash cycle operational activities.

8 (Consequently), Share of activities performed by commercial banks and CIT companies seems to increase.

9 CIT companies are slowly moving up the value chain with some CIT companies already operating as a CMC (Cash Management Company), providing value-adding services in addition to pure cash logistics activities. These services include: monitoring/forecasting, providing Same Day Credit, 'smart vaults', etc.

10 Additionally, repositioning in the value chain is facilitated by EU regulations such as, PSD and the upcoming PSD2, allowing CIT companies (and other companies) to become a "Payment Institution" (PI) or "third party payment service provider" (TPP). Besides the opportunity to provide additional services, this also means that these parties come under more direct oversight.

11 This also opens the door for new entrants into this market, with most of these focussing on the electronic payment domain, rather than the cash market, yet still with a potential effect on the cash market.

12 The recirculation of cash seems to be done more and more at the level of retailers/consumers. This varies per country and depends largely on the organisation of each country's cash cycle.

13 Efficiency within the cycle seems to be found in recirculation of cash in the lower part of the cycle (CITs/Retailers/ATMs/consumers, see figure 28), supported and facilitated by increasingly sophisticated cash logistics software and services.

In this chapter we have established and analysed the current status, trends and developments on the use and organisation of cash on a European level. We have made initial observations and explored possible explanations for these developments. In the next chapter we'll take this analysis a step further by looking at the relevant data per individual EU member state and making cross-country comparisons.


TOUR EIFFEL
47 CM
20€
POST CARDS
1= 1€
6= 5€
PORTE-CLES
KEYCHAINS
1= 0,50 €
5= 2 €
TOUR EIFFEL
38 CM
15€
TOUR EIFFEL
COULEUR
18 CM
5€
TOUR EIFFEL
18 CM
4€
TOUR EIFFEL
14 CM
3€
Paris

3 Cash in Europe – cross-country comparisons

One of the main objectives of the European Union is to create a single Europe. This is an ambitious objective, and even though Europe has already come a long way to further integration, it is apparent that there are still many differences between the member states. These differences are apparent in many aspects in our European society and also for payment services and cash usage and logistics in particular.

In 20 out of 28 EU countries cash represents over 50% of all payment transactions

G4S Analysis based on ECB Statistics & The Social and Private Costs of retail Payment Instruments (2012)

In chapter 2 the main payments and cash trends and developments on a European level have been discussed. In this chapter the focus will be on the individual member states. How do they score on the key aspects in cash payments, such as transaction volumes and the number of ATMs? Are there significant differences and, if so, how can they be explained?

Besides a cross-country comparison on individual country basis, also clusters of countries will be analysed and compared to see whether any noteworthy differences can be observed. Also an overview of qualitative aspects such as legislation and cash cycle organisation will be presented.

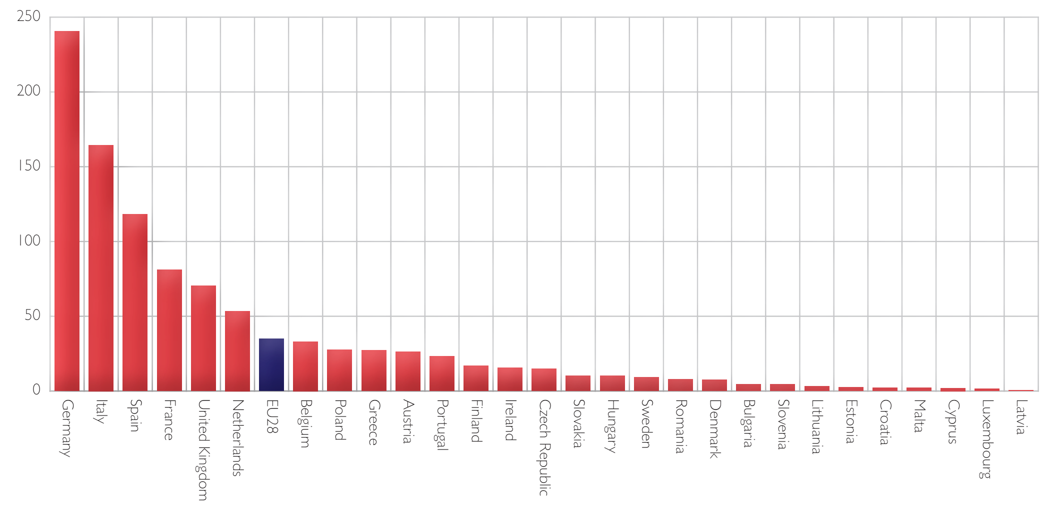
3.1 Cash payment statistics per country

3.1.1 Cash in Circulation

As presented in chapter 2 Cash in Circulation increases steadily year on year on a European level. When looking at the individual member states we see differences per country, as figure 29 shows[44].

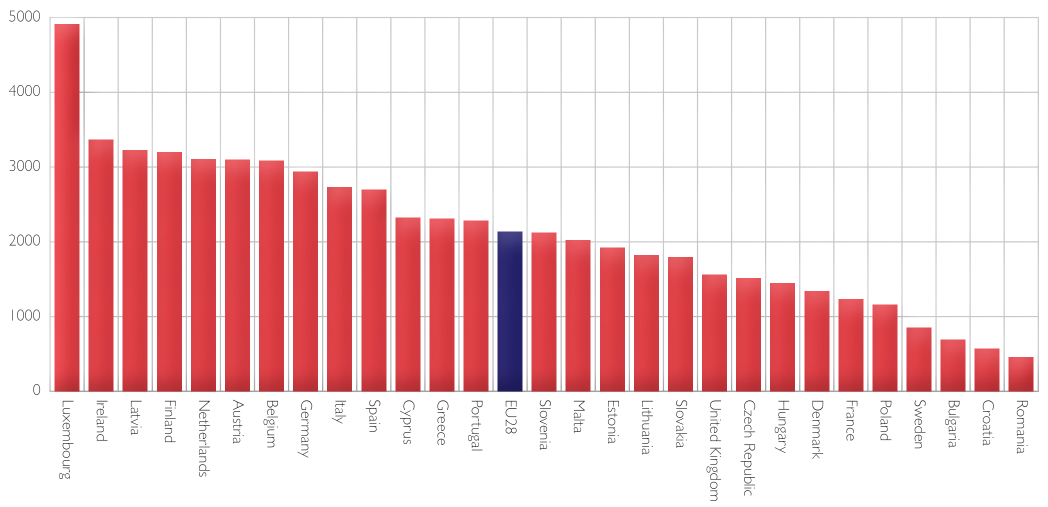
44 Source: ECB statistics; NCB annual Reports 2014. Note: ECB reports on Euro Area total only. Scores for individual Euro countries in figure 29 are taken from the NCB's annual reports 2014 when reported on specifically, or from the NCB balance sheet 2014 Liabilities Item 1: Banknotes in Circulation as an indication of Cash in Circulation for that country.

Figure 29 Currency in Circulation (x Mio euro, EU28, 2014)



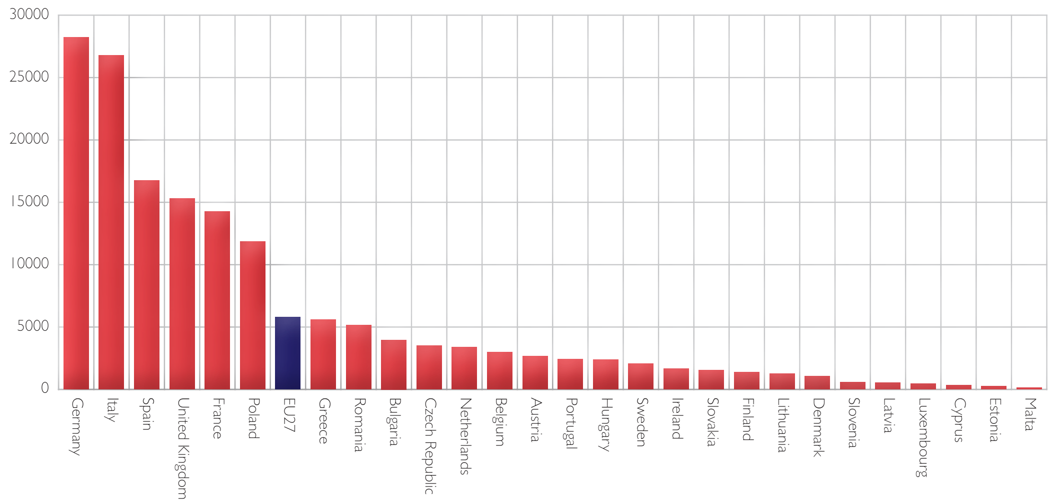
Source: ECB statistics

Figure 30 Currency in Circulation per country per capita (Euro, EU28, 2014)



Source: ECB statistics

Figure 31 Cash transaction volume per country (x Mio, EU27, 2012)



Source: G4S analysis based on ECB statistics 2012 + The Social and Private Costs of Retail Payment Instruments: A European perpective, by Heiko Schmiedel, Gergana Kostova and Wiebe Ruttenberg, 2012. Croatia did not report on this subject.

Currency in Circulation per Capita
The total cash in circulation correlates highly with a country's population. A more comparable overview is presented in figure 30, showing cash in circulation per country per capita.

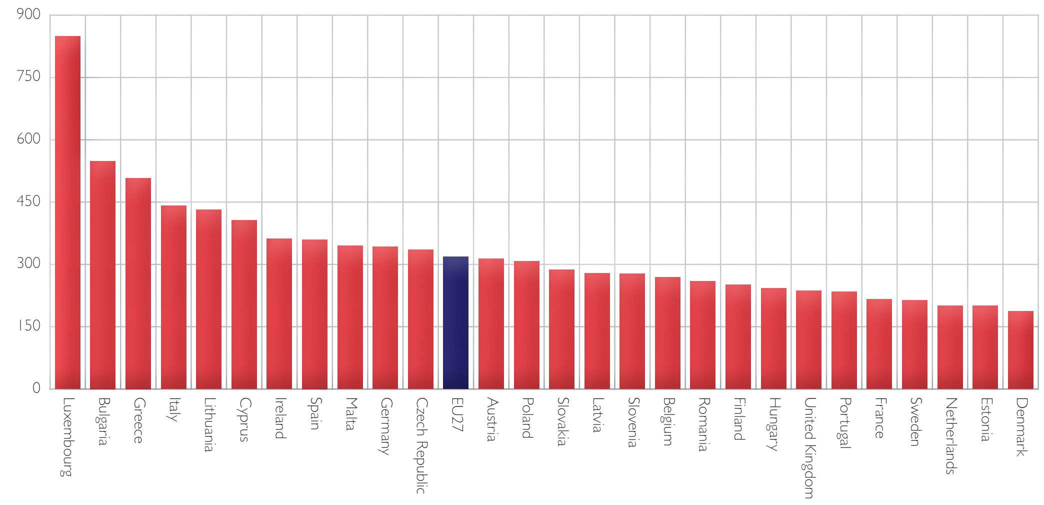
The high score of Malta in this graph is remarkable, with a score of over 2.5 times higher than the EU average and 1.5 times higher than the number two in this chart Ireland. Cash in circulation per capita in Greece is relatively high whereas other cash intensive countries, such as Bulgaria and Romania, score at the lower end in this chart. Conversely, cash in circulation per capita is relatively high in lower cash countries such as The Netherlands and Finland.

3.1.2 Cash versus non-cash usage

The cash transaction volumes are difficult to calculate exactly, simply because many cash transactions are anonymous. The Currency in Circulation shows us how much cash is available in a market, and as such it can be regarded as an indicator of how many cash transactions take place in a certain market. However, as outlined earlier, cash in circulation is not only used for performing transactions, but also for other purposes such as hoarding. Based on various publications by the ECB[45] the number of cash transactions has been calculated and is presented in figures 31 (total per country) and 32 (cash transaction volume per capita). Not surprisingly, the most populous countries top this chart.

45 ECB statistics + The Social and Private Costs of Retail Payment Instruments: A European perpective, by Heiko Schmiedel, Gergana Kostova and Wiebe Ruttenberg, 2012.

Figure 32 Cash transaction volume per capita (EU27, 2012)



Source: G4S analysis based on ECB statistics 2012 + The Social and Private Costs of Retail Payment Instruments: A European perspective, by Heiko Schmiedel, Gergana Kostova and Wiebe Ruttenberg, 2012. Croatia did not report on this subject.

Luxembourg is at the top of these rankings. Do the citizens of Luxembourg use a lot of cash because the Cash in Circulation is high, or is it the other way around?

Ton Roos' (ECB) statement might shed some light onto this: "the ECB together with the NCB's determines the need for money supply per country and for Europe as whole. As long as citizens want to use cash as payment instrument, we will supply it. The consumer has the final say."

Together with Luxembourg, Bulgaria, Greece, Italy and Lithuania complete the top 5. At the other end Denmark, The Netherlands, Estonia, Sweden and France have the lowest scores on cash transactions per inhabitant.

Now that we have established the use of cash per country, it would be interesting to see how this relates to the use of other (non-cash) payment instruments in each country.

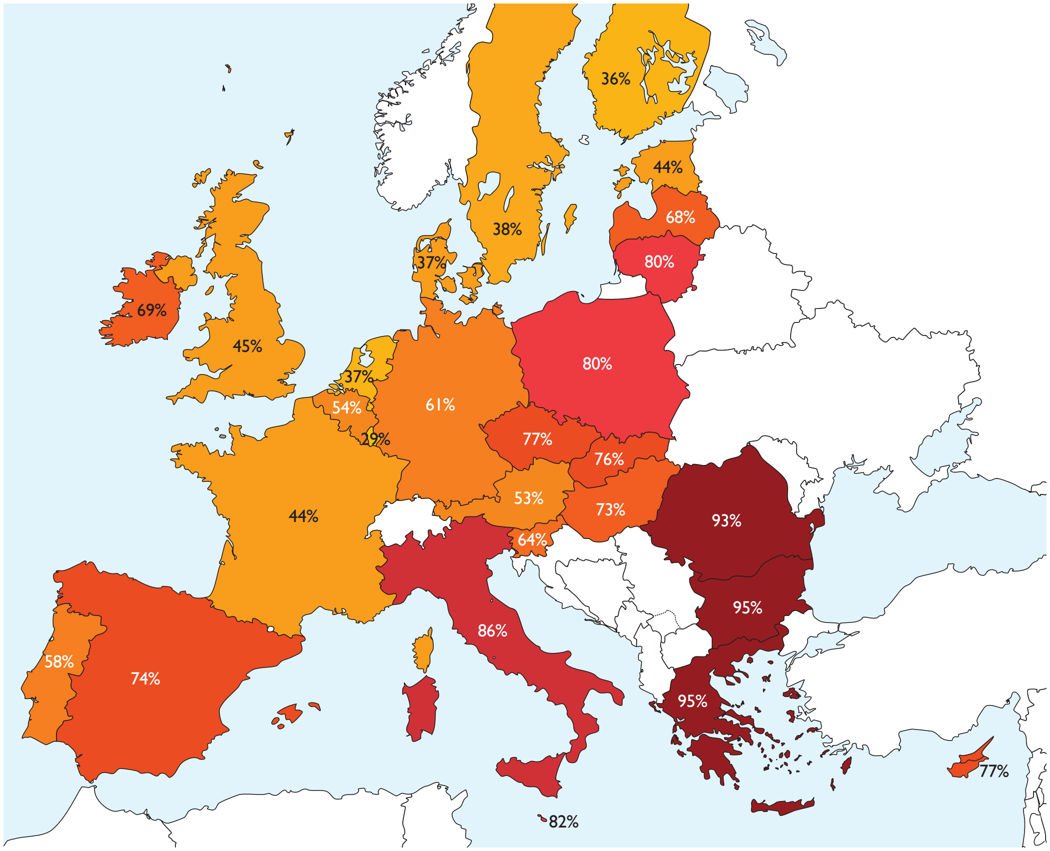
Cash vs non cash payment instruments

Figure 33 shows the total percentage of all transactions in a country paid in cash[46]. Please note that this includes all payment transactions, including C2C, C2B (retail), B2C and B2B. The percentage of cash transactions in a consumer/retail (C2C or C2B) environment - where cash is commonly most used - would be even higher.

A number of conclusions can be drawn from this overview:

46 The Social and Private Costs of Retail Payment Instruments: A European perspective, by Heiko Schmiedel, Gergana Kostova and Wiebe Ruttenberg, 2012.

Figure 33 Percentage of cash in total transaction volume per country (EU27, 2012)

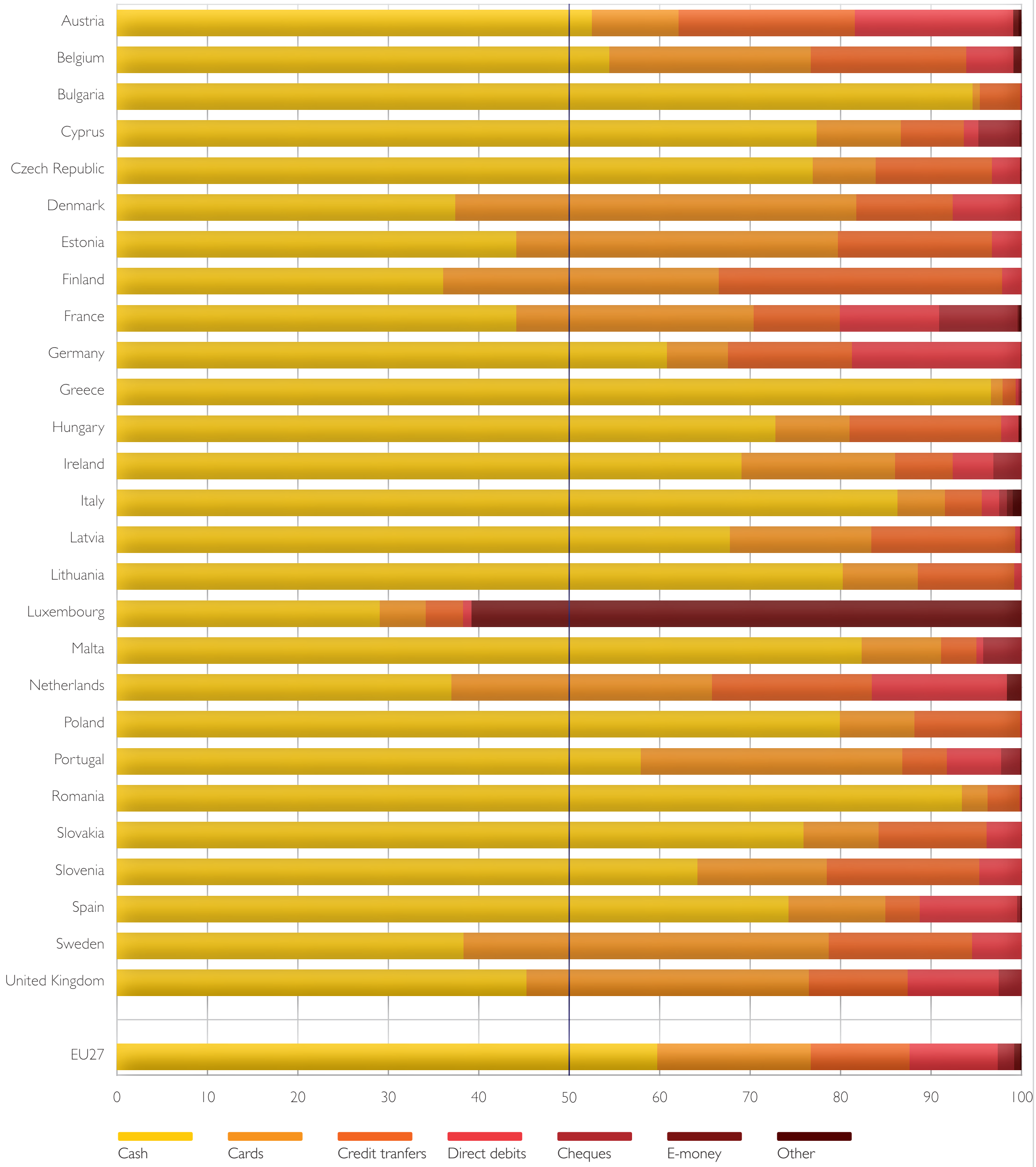


Source: The Social and Private Costs of Retail Payment Instruments: A European perspective, by Heiko Schmiedel, Gergana Kostova and Wiebe Ruttenberg, 2012.

1 With 59.7% of all transactions cash is by far the most used payment instrument across the European Union.
2 The use of cash versus non-cash differs widely across EU member states.
3 Relative cash usage is highest in southern and/or eastern countries, with the first 12 places occupied by countries from those regions.
4 Relative cash usage is lowest in Northern and/or Western countries, with the bottom 6 places occupied by countries from those regions.

There seems to be a disparity in cash usage between these areas. In paragraph 3.3 we will give more attention to the differences between geographical areas within Europe.

Figure 34 Payment instrument distribution cash and non-cash per country (EU27, 2012)



Source: G4S analysis based on ECB statistics 2012 + The Social and Private Costs of Retail Payment Instruments: A European perspective, by Heiko Schmiedel, Gergana Kostova and Wiebe Ruttenberg, 2012. Croatia did not report on this subject.

Distribution across payment instruments (cash & non cash)

Figure 34 shows the distribution across all payment instruments (including cash and non-cash) per country.

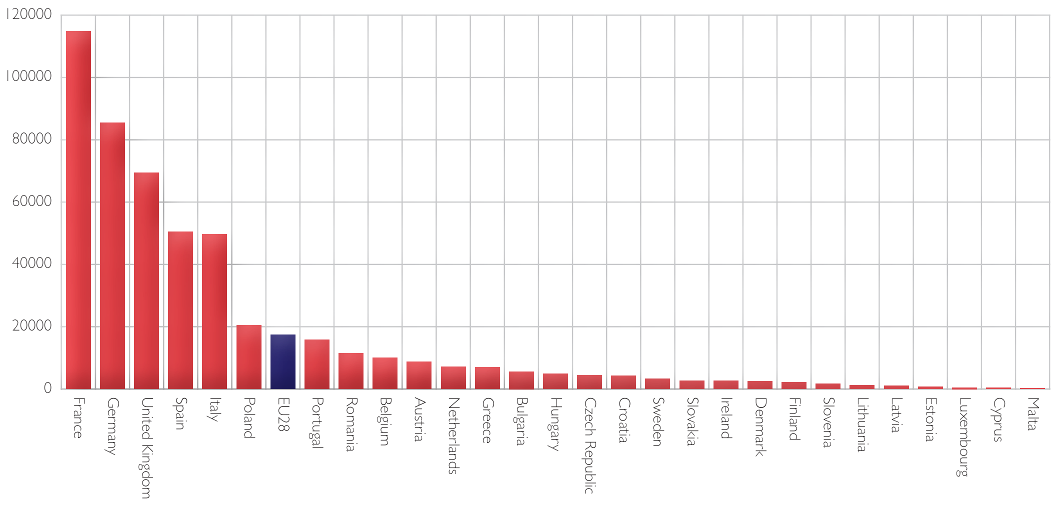
The main observations from this overview are:

- In 20 out of 28 EU countries cash represents over 50% of all payment transactions.
- Countries like Greece, Bulgaria and Romania almost solely pay by means of cash.
- Cash is the largest payment instrument in terms of volume in all countries, except Denmark, Sweden and Luxembourg[47].
- In Denmark and Sweden cards are most used, while e-money purchase transactions are most prevalent in Luxembourg.

After having analysed the use of cash per country the question arises how these observed differences can be explained? Perhaps an explanation can be found by looking at other key aspects in cash logistics, such as access to cash. As mentioned earlier in this report the two main cash distribution points for consumers are ATMs and Bank Branches.

47 The Luxembourg statistics include the total eMoney purchase transaction volume of Paypal Europe, which can strictly not be attributed to Luxembourg alone. When adjusted for this, cash would also be the largest payment instrument in terms of volume in Luxembourg, representing 71%.

Figure 35 Number of ATMs per country (EU28, 2014)



Source: ECB statistics

3.1.3 Availability of Cash

Automated Teller Machines (ATMs)
The total number of ATMs provided by PSPs in a country[48] is shown in figure 35, while figures 36 and 37 show the number of ATMs relative to population and square kilometre, indicating ATM density in a country.

France and Portugal are clearly leading in ATMs per capita, with other South/Western European countries such as Spain, UK and Germany completing the top 5. Sweden, Finland and Czech Republic have the lowest number of ATMs per inhabitant.

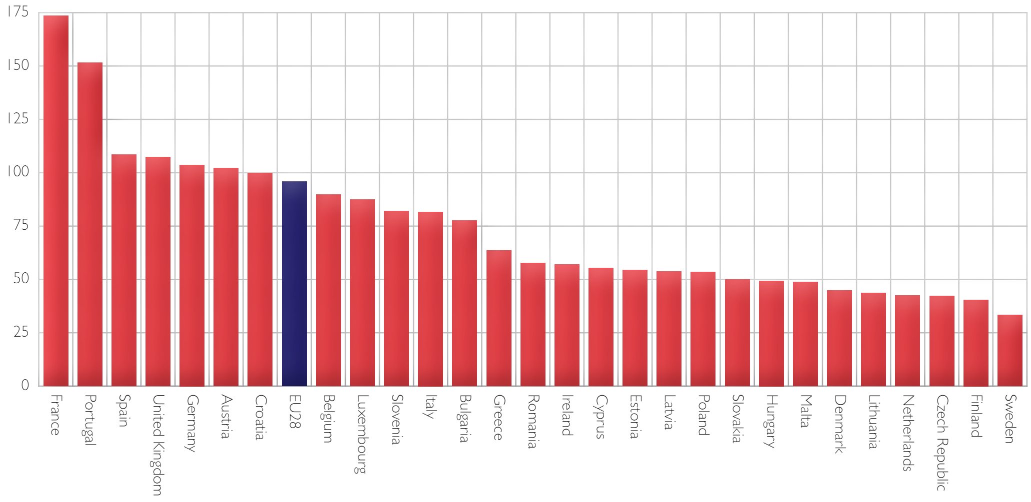
When it comes to coverage of ATMs in a country, figure 37 shows that Malta by far has most ATMs per km^2.

Western European countries such as Belgium, UK, Germany, Luxembourg, France, The Netherlands, Portugal and Italy all score higher than the EU average.

As an intermediate conclusion, this seems to suggest that there is no correlation between the relative number of ATMs (per capita or per km^2) and the usage of cash in a country as most Western European countries score high on the availability of ATMs yet score relatively low on the usage of cash.

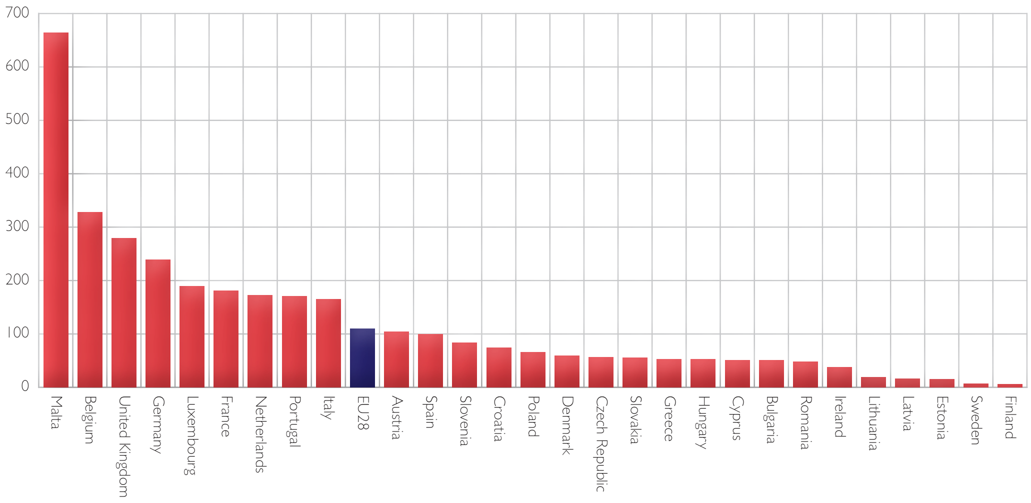
48 ECB statistics

Figure 36 Number of ATMs per 100,000 capita (EU28, 2014)



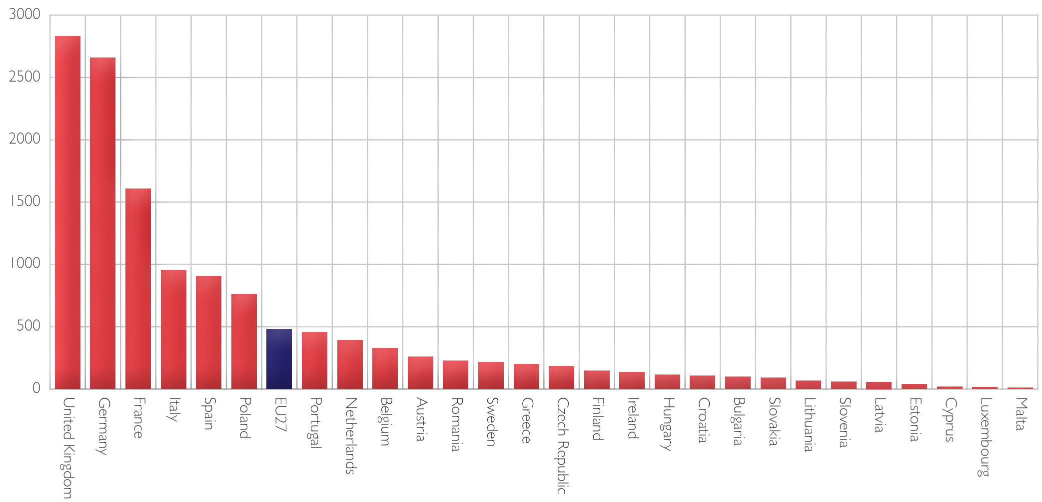
Source: ECB statistics

Figure 37 Number of ATMs per 1,000 km^2 (EU28, 2014)



Source: ECB statistics

Figure 38 Number of ATM withdrawals (x Mio, EU 27, 2014)



Source: ECB statistics. Denmark did not report on this subject.

ATM withdrawals
It is also interesting to see whether the availability of cash has an influence on the number and value of ATM withdrawals. Firstly, the number of ATM withdrawals is examined.

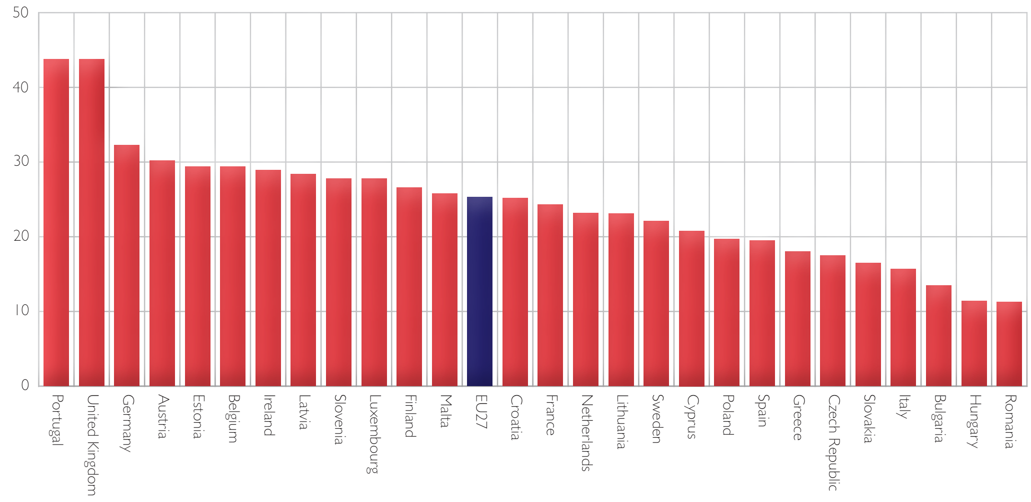
We see that the larger countries logically have the most ATM withdrawals in absolute numbers[49] (figure 38). When looking at the total number per capita (figure 39) the picture is somewhat different, yet UK and Germany score high in this category as well.

Portugal is leading in number of ATM withdrawals per capita, just before the UK. Germany, Austria and Estonia complete the top 5. At the other end, Romania, Hungary, Bulgaria, Italy and Slovakia are listed as the countries with the lowest score on ATM withdrawals per capita. This is interesting as these countries are cash intensive countries and one would have expected them to score higher in this category. Perhaps this means that these countries withdraw their cash not from an ATM but instead from a bank branch or that they withdraw higher amounts per ATM withdrawal.

Figure 40 provides a first insight into the value of ATM withdrawals across the EU, with figures 41 and 42 showing the value of an ATM withdrawal per capita and the average value of an ATM withdrawal.

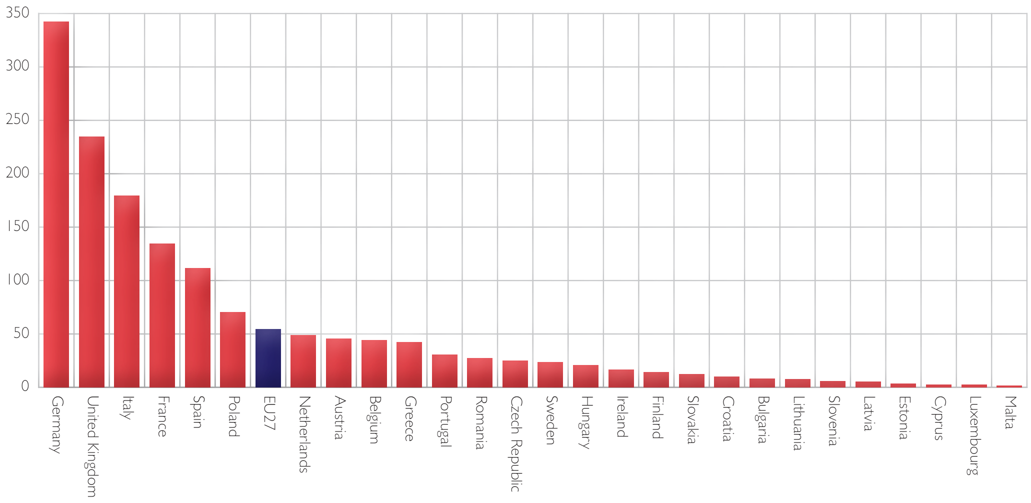
49 ECB statistics

Figure 39 Number of ATM withdrawals per Capita (EU27, 2014)



Source: ECB statistics. Denmark did not report on this subject.

Figure 40 Value of ATM withdrawals (x Bio euro, EU27, 2014)



Source: ECB statistics. Denmark did not report on this subject.

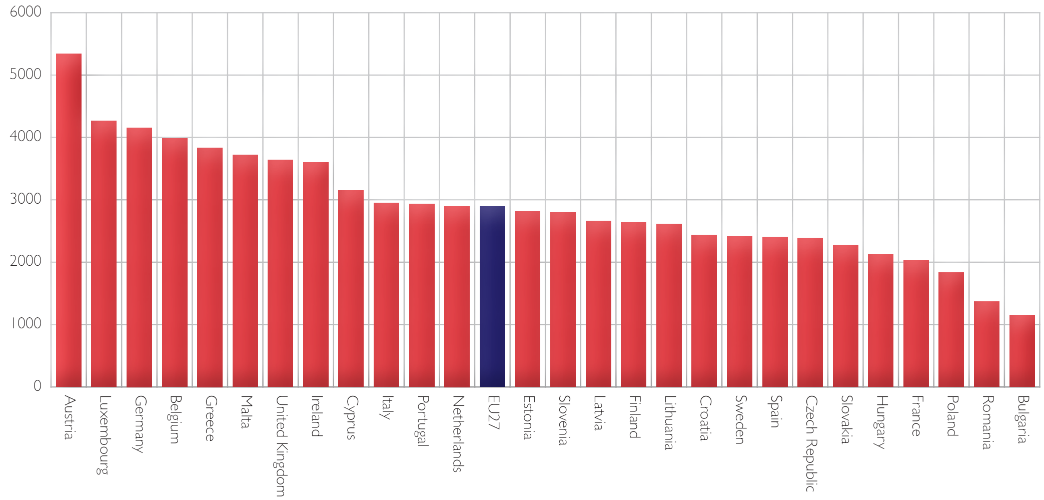
Citizens of Austria, Luxembourg, Germany, Belgium and Greece withdraw the highest amounts from an ATM per annum. Eastern European countries score lowest in this chart even though these countries are cash intensive. Perhaps this has to do with the cost of living in those countries. Further analysis is needed to substantiate this initial hypothesis.

With the EU average of 114,04 euro[50] Greece is topping this chart, with 213.11 euro per ATM transaction; almost double the EU average. Portugal is at the bottom with 66.92 euro per ATM transaction. Also the UK (83.00 euro), France (83.86 euro) and Bulgaria (85.48 euro) score at the lower end of this chart.

Besides ATMs the bank branch is a second significant distribution point for cash.

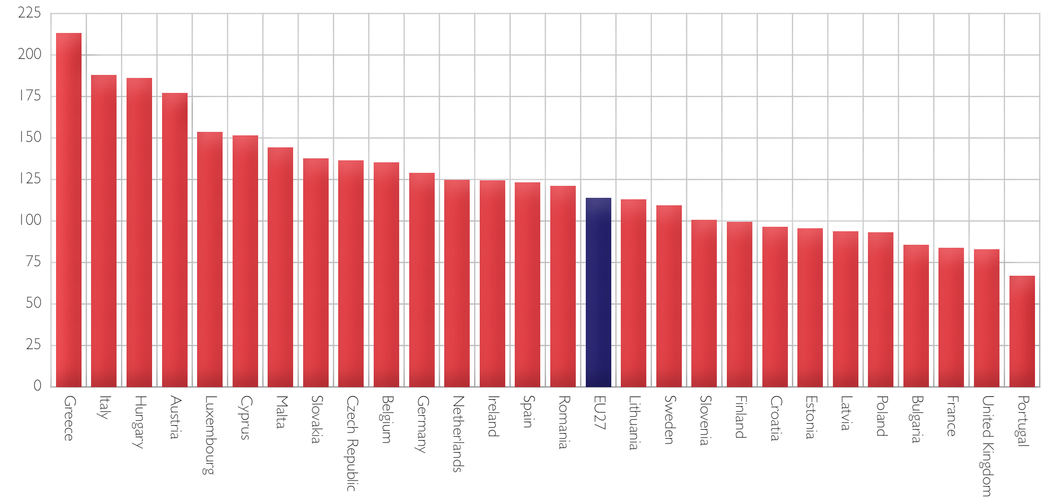
50 ECB statistics

Figure 41 Value of ATM withdrawals per capita (Euro, EU27, 2014)



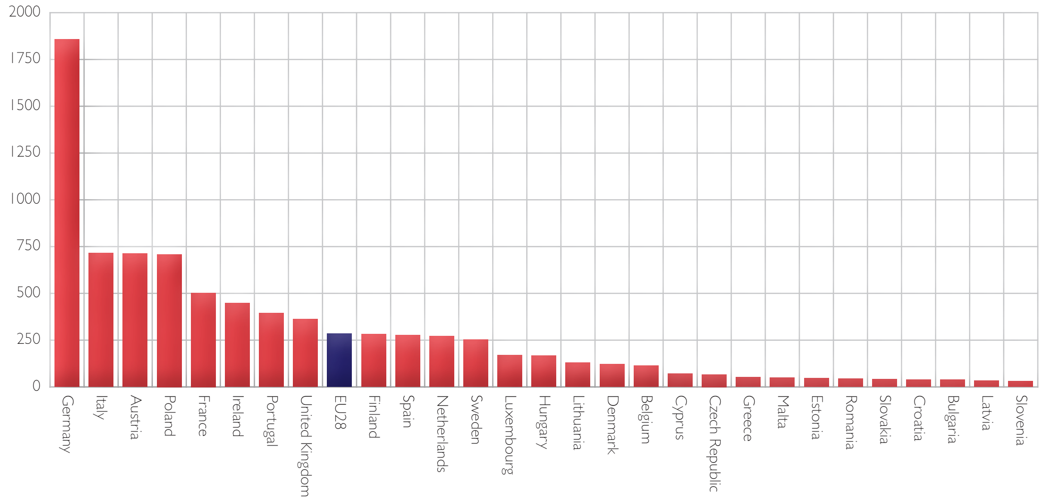
Source: ECB statistics. Denmark did not report on this subject.

Figure 42 Average value of ATM withdrawals (Euro, EU27, 2014)



Source: ECB statistics. Denmark did not report on this subject.

Figure 43 Number of institutions offering payment services to non-MFIs (EU28, 2014)



Source: ECB statistics

Banks offering payment services

The number of banks, or Monetary Financial Institutions (MFIs), offering payment services in a country is depicted in figure 43[51].

Even though it is interesting to see the number of licensed MFIs per country, when it comes to the distribution of cash, the number of branches is more relevant.

Bank Branches of Institutions offering payment services to non-MFIs

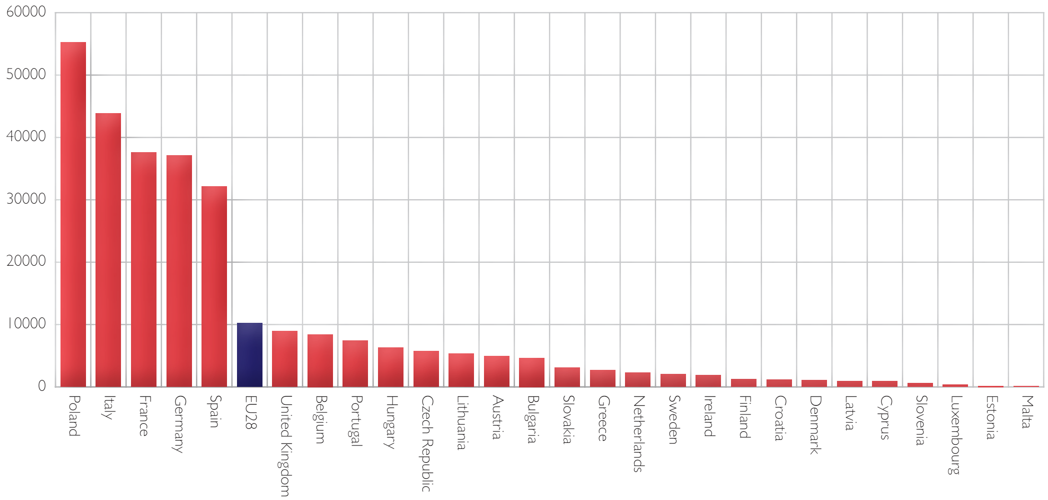
Poland, Italy, France, Germany and Spain clearly lead the EU when it comes to the total number of bank branches (of institutions offering payment services) in the country.

Lithuania, Poland and Cyprus form the top 3 of bank branches per inhabitant. The Netherlands, UK, Denmark, Sweden and Finland have very few bank branches per inhabitant, which may be correlated to the highly developed electronic banking environments in these countries. However, this cannot be said for countries like Greece, Croatia, Slovenia, Malta and Estonia, yet they also score well below the EU28 average for branches per capita, with Estonia at the bottom of this chart.

Figure 46 shows that Malta, Belgium and Poland have the highest density of bank branches in the country. Also Luxembourg, Italy and Germany score well above the EU average.
Another intermediate conclusion can be that both the number of ATMs per capita and the

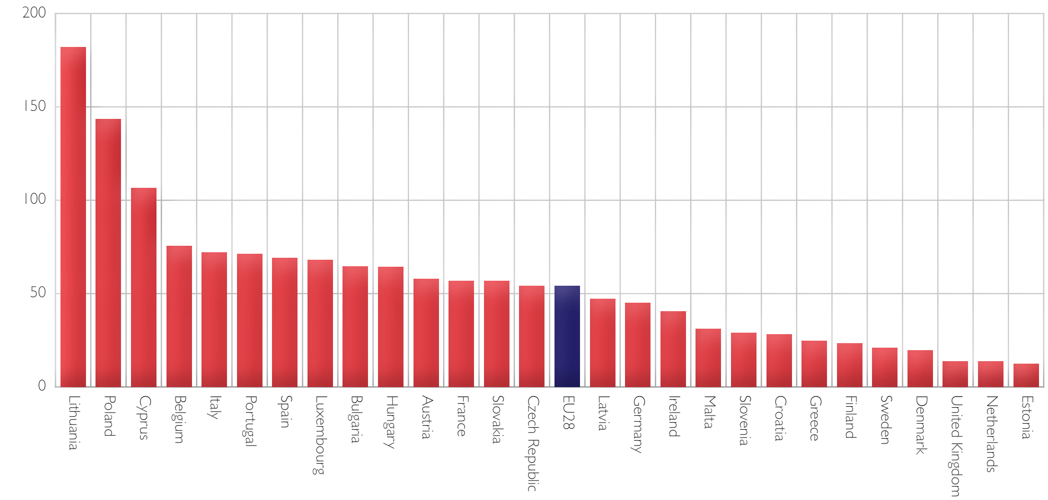
51 ECB statistics

Figure 44 Number of branches of institutions offering payment services (EU28, 2014)



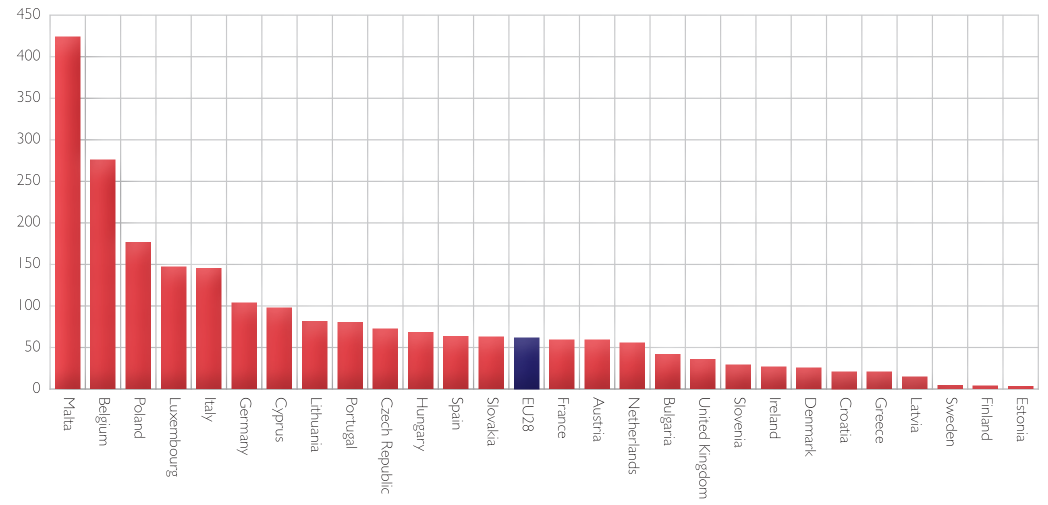
Source: ECB statistics. Romania did not report on this item.

Figure 45 Number of branches of institutions offering payment services per 100,000 Capita (EU28, 2014)



Source: ECB statistics

Figure 46 Number of branches of institutions offering payment services per 1,000 km² per country (2014)



Source: ECB statistics

number of Bank Branches per capita do not seem to correlate with the usage of cash in a country. Countries where cash is mostly used (as a share of total transaction volumes in those countries) such as Greece, Bulgaria and Romania do not score at the top of the charts when it comes to ATMs or bank branches per capita or km².

Apparently the use of cash is (also) related to other factors, such as access to the required infrastructure (e.g. having a bank account, a debit card), as we'll see later in this chapter. Also, the level of cost of living in a particular country will influence the amount of cash required.

3.1.4 Alternatives to Cash

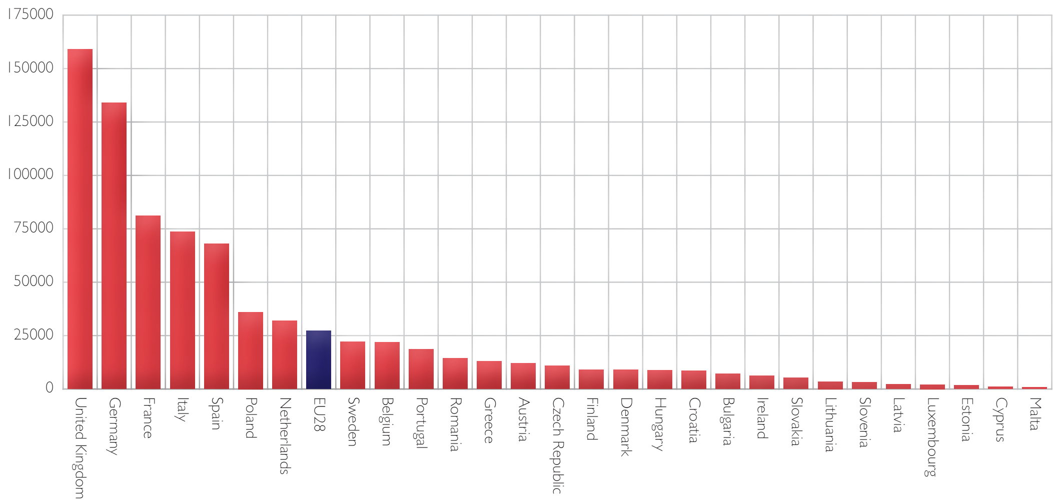
Cash is mostly used in a retail or Consumer-to-Consumer environment with card transactions being a competitive second in most countries. Two key elements in this infrastructure are the number of cards issued and POSs in a country.

Cards Issued

Figure 47 shows that the number of cards issued in a country again is strongly related to the population. Figure 48 shows the number of cards issued per capita.

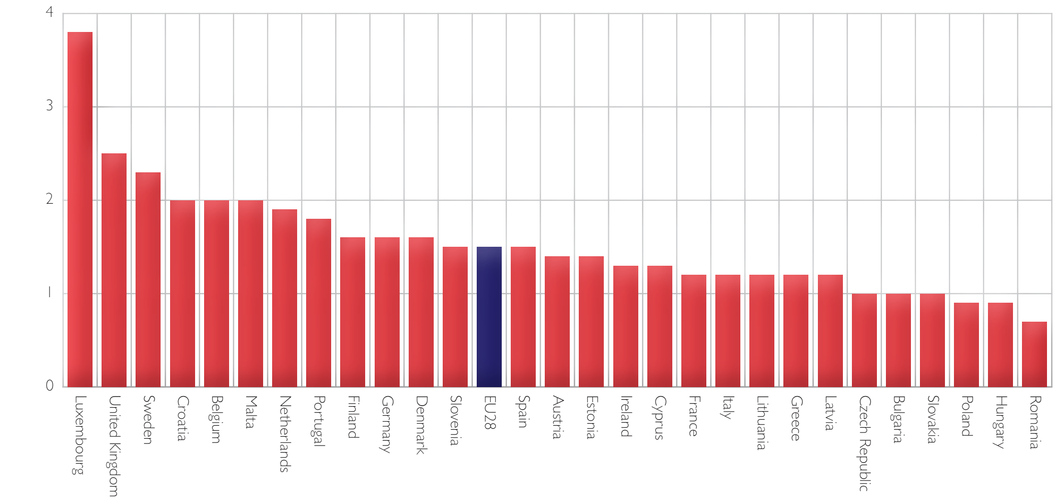
The high score of Luxembourg (3,8 cards per inhabitant) is most notable when examining this graph. Also UK, Sweden and Croatia have at least 2 cards per inhabitant. Eastern European countries mostly dominate the tail end of this chart. However, 24 out of 28 countries average at least 1 card per inhabitant.

Figure 47 Number of cards issued (× Mio, EU28, 2014)



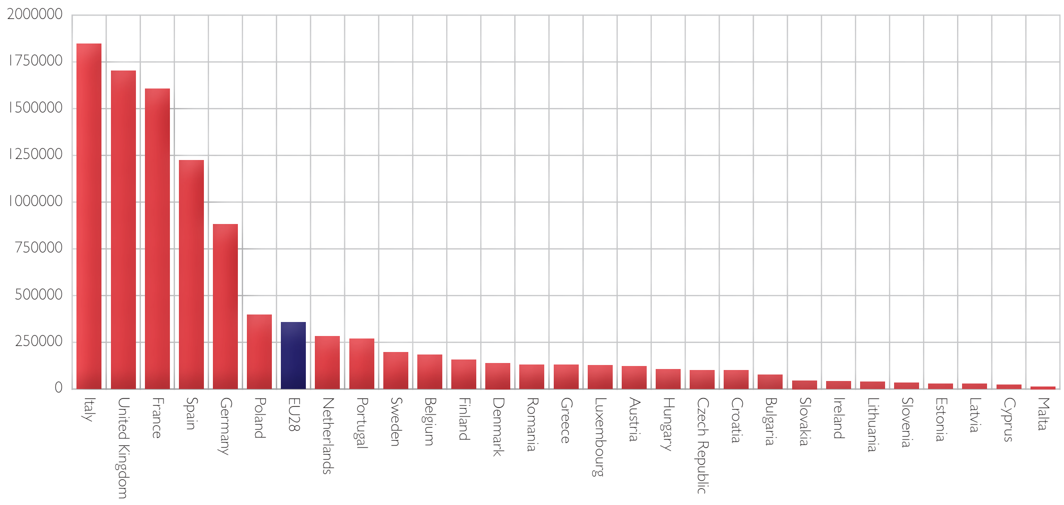
Source: ECB statistics

Figure 48 Number of cards issued per capita (EU28, 2014)



Source: ECB statistics

Figure 49 Number of POSs per country (EU28, 2014)



Source: ECB statistics

Point of Sale (POS) terminals
Whereas ATMs provide access to cash, the number of POS (Point of Sale) terminals provides insight into the availability of the electronic payment infrastructure in a country.

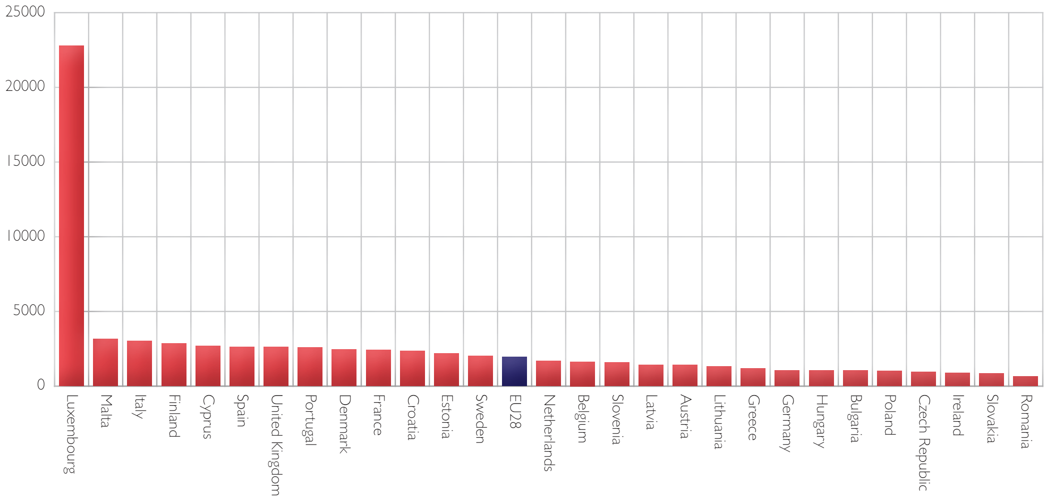
Figure 49 shows that again, the 5 most populous countries make up the top five. However, Germany (the most populous country) has significantly less POS terminals than the Italy or the UK, which could be explained for the UK, by their relatively higher usage of card payments. However, for Italy this is not the case and it can only be concluded that Italy has a high number of POS terminals relative to its use of cards.

The score for Luxembourg in this graph is extreme. This can be explained by a significant growth in the number of POSs provided by resident payment service providers in Luxembourg in 2014 as will be discussed in more detail in the Luxembourg country page.

Malta, Italy, Finland and Cyprus complete the top 5, while Romania, Slovenia and Ireland are closing this chart (figure 50). The lower ranked countries are mostly Eastern European, with the notable exception of Ireland and Germany, which also score well below the EU average of 1,969 POS terminals per 100,000 inhabitants.

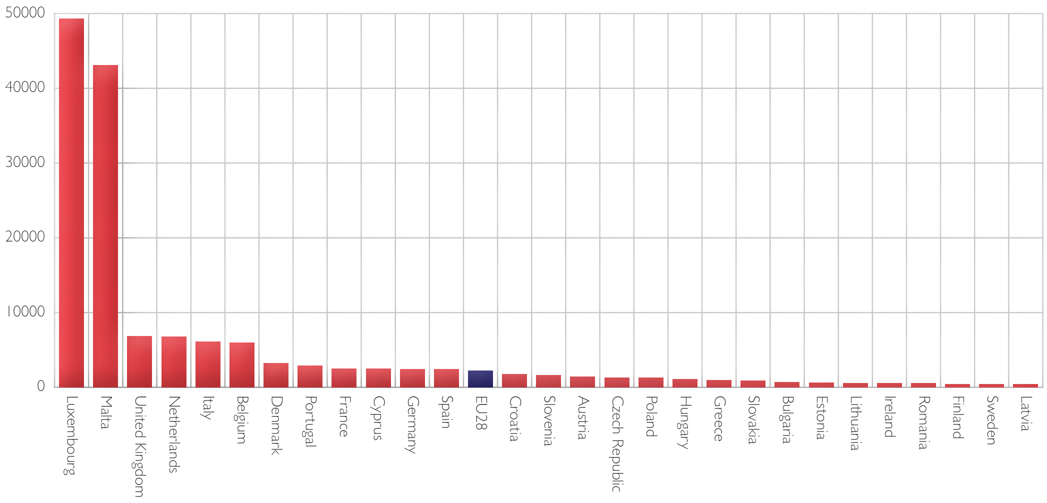
Again Luxembourg, now joined by Malta, shows an extremely high score in this category (figure 51), which can partly be explained by the small size of these countries. The UK and The Netherlands together with Italy and Belgium all have more than 6,000 POS terminals per 1,000km^2; well above the EU28 average of 2.248.

Figure 50 Number of POSs per 100,000 capita (EU28, 2014)



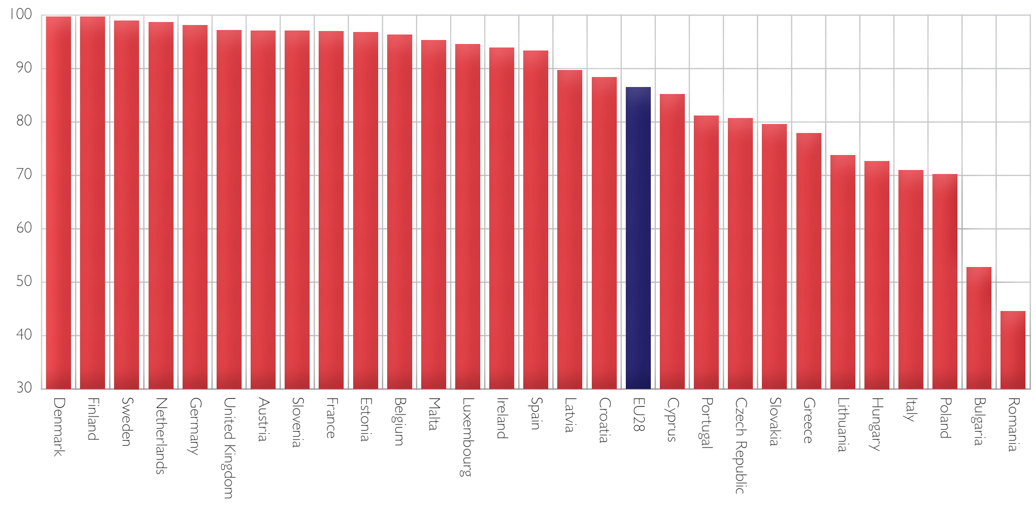
Source: ECB statistics

Figure 51 Number of POSs per 1,000 km^2 (EU28, 2014)



Source: ECB statistics

Figure 52 Account at a formal financial institution (EU28, % population, age 15+, 2014)



Source: World Bank

Account at a formal financial institution

86%[52] of the EU28 population (age 15+) holds at least one bank account at a formal Financial Institution (figure 52). However there are significant differences between countries. Western and Northern European countries seem to score very high (with Denmark nearing complete coverage at 99.7%) whereas the Eastern countries are trailing, with Bulgaria (52.8%) and Romania (44.6%) closing this chart. This data seems to suggest a correlation between the % of the population with a bank account and cash usage in a country, as suggested earlier in this chapter. Further quantitative analysis is required to substantiate this initial observation.

52 World Bank 2014, Global Financial Development Report, Financial Inclusion

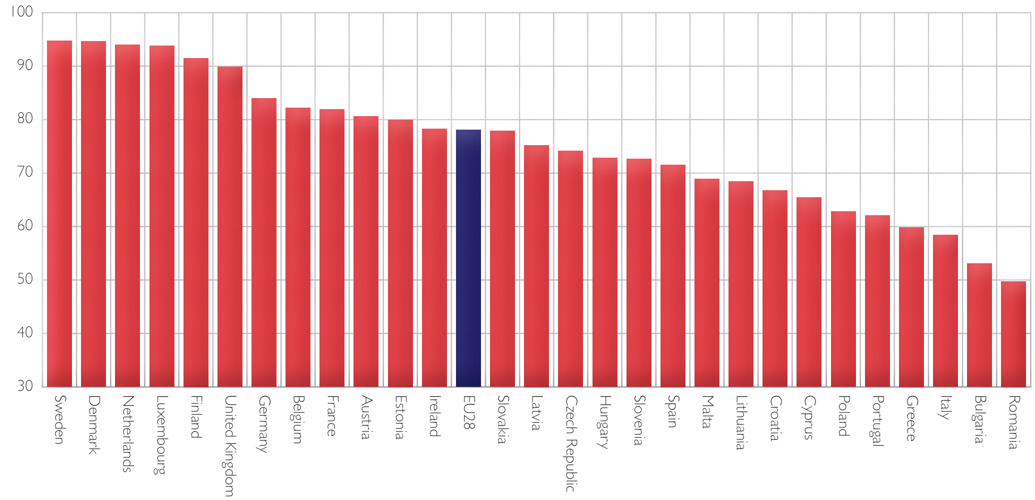
Internet penetration

The Internet penetration in a country is an important indicator and prerequisite for a population to participate in online commerce and online banking. All these indicators could have an impact on the number of electronic payments and perhaps also on the number of cash transactions in a country. North-western countries clearly have higher Internet penetration than do the south-eastern countries of the European Union. However all countries, except for Romania, score 50% or higher.

Use of online banking

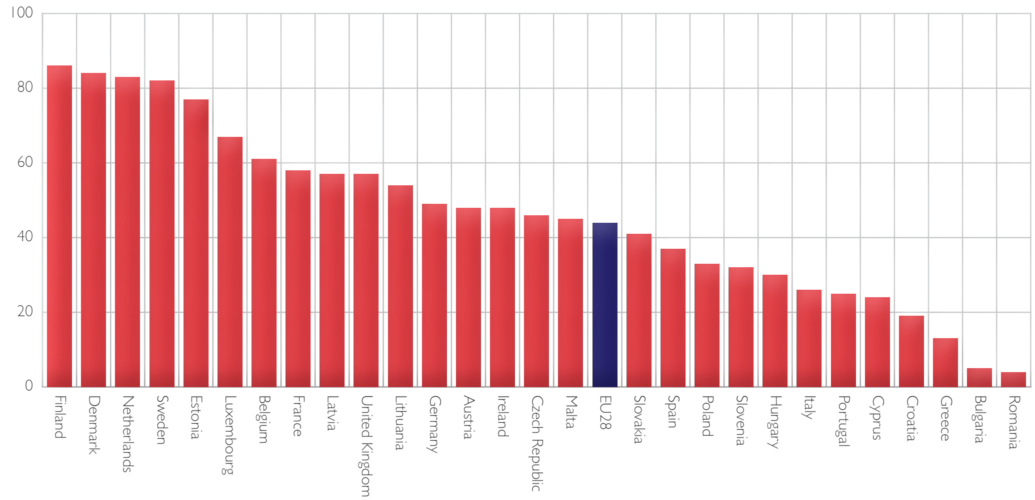
Within the EU Scandinavian countries such as Finland, Denmark and Sweden score high on this scale, as well as The Netherlands. Southern-Eastern countries such as Romania, Bulgaria, Greece, Croatia and Cyprus have very low use of online banking.

Figure 53 Internet penetration (% of population, EU28, 2014)



Source: World Bank

Figure 54 Use of online banking (%, EU28, 2015)



Source: Statista.com

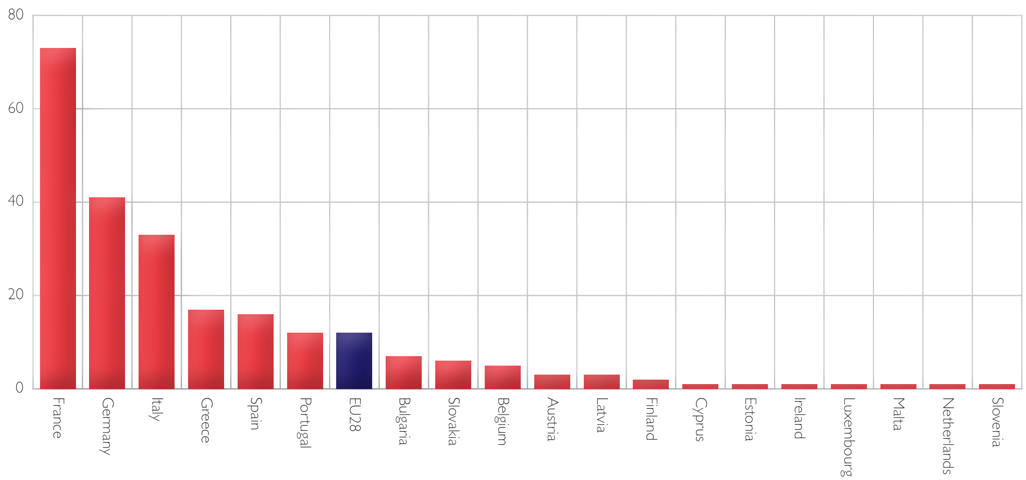
3.1.5 Organisation of the Cash Cycle

The number of branches of National Central Banks (NCB) may give an indication of the governance and set up of cash logistics in a country and the level of active involvement of the NCB in the cash cycle, as discussed in chapter 2 of this report.

France has by far the highest number of NCB branches, with Germany, Italy, Greece and Spain also scoring (well) above the EU average of 12 NCB branches per country.

As the overview shows, most countries have 2 to 6 CIT companies. With 2,000 active CIT companies Poland jumps off the page, making this a highly fragmented market. However, it should be noted that the number of CITs in Poland with a national license has dropped from 12 (2005) to 5 (2015) as a result of consolidation in the market.

Figure 55 Number of NCB branches per country (2014)



Source: Statista.com, 2015 - Data was not available for all EU member states.

Still, there are many smaller CITs operating on a local level in the country. Also Italy, Bulgaria and to a lesser extent Germany and the UK score well above the European average number for CIT companies per country. It should be noted that this fragmentation on the supply side could indicate fragmentation on the demand side (mostly retail/banking) as well.

Based on the above it could be argued, that there is room for Consolidation in these markets, as long as standardisation and harmonisation within these markets allow for this. This, in turn, would lead to improved efficiency and reduced cost for cash logistics as a whole.

Putting in place certification of CITs/CMCs, as suggested by the ECB, may not only lead to improving the overall service levels but also to further consolidation in the CIT market.

Given the fragmentation of the CIT market in Europe, it is most likely that, if consolidation occurs, it will be within national borders first.

Figure 56 Cash Logistics Industry (2012)

Country	Number of companies	Number of personnel	Number of dedicated security vehicles
Andorra	2	40	8
Austria	3	1000	241
Belgium	2	1300	280
Bulgaria	100	530	212
Croatia	n/a	n/a	n/a
Cyprus	2	150	45
Czech Republic	2	821	330
Denmark	n/a	n/a	n/a
Estonia	1	130	52
Finland	2	418	167
France	12	10000	1500
Germany	56	11000	2500
Greece	3	1200	445
Hungary	13	2300	650
Ireland	6	1100	260
Isla of Man	3	52	8
Italy	160	6800	1450
Jersey	1	28	5
Latvia	3	125	50
Lithuania	10	200	80
Luxembourg	2	210	40
Malta	3	76	22
Netherlands	3	2000	400
Norway	2	800	250
Poland	2000	9500	2500
Portugal	5	1250	390
Romania	10	1500	400
Serbia	13	500	330
Slovakia	2	300	170
Slovenia	n/a	n/a	n/a
Spain	10	5000	850
Sweden	3	1500	400
Switzerland	8	850	450
Turkey	6	1000	2000
Ukraine	2	900	300
United Kingdom	14	11665	3129
Total	2464	74245	19914

Source: ESTA

3.2 Country clusters; significant differences between sets of countries

It is not only interesting to look at the differences between each individual EU member state, but also to see whether there are notable differences between sets of countries. Obviously 28 countries can be grouped in many different ways, yet for the purposes of this report we have limited the country clusters to these three:

1 Euro vs Non-Euro countries
2 North vs South European countries
3 West vs East European countries

We have looked at the aggregated scores per (100,000) capita of these groups of countries on a selection of the variables discussed in (the previous) paragraph. The most significant findings from these analyses will be presented here.

3.2.1 Euro vs non euro

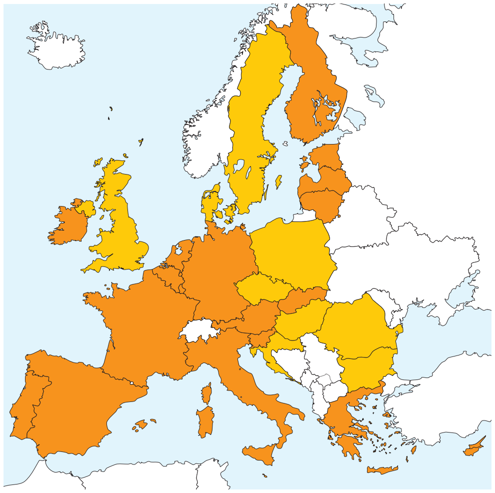
Euro countries are obviously the countries within the EU28 using the euro as their currency. These countries are: Belgium, Cyprus, Germany, Estonia, Finland, France, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Austria, Portugal, Slovenia, Slovakia and Spain.

Non-euro countries are: Bulgaria, Denmark, Hungary, Croatia, Poland, Romania, Czech Republic, United Kingdom and Sweden.

The most notable and interesting differences are presented and briefly reflected in figure 57.

The percentage of cash transactions is largely the same for euro and non euro countries. Cash in circulation is significantly higher in euro countries and also the cash transaction volume per capita is higher in the eurozone. Non euro countries perform slightly more ATM withdrawals yet with a significantly lower average amount per transaction. The eurozone seems to have better access to cash judged by the higher number of ATMs and branches of institutions offering payment services per 100,000 capita. While inhabitants of non-euro countries on average carry more cards with them, they can use these cards at less POS terminals. Finally, significantly more inhabitants of the eurozone have an account at a formal financial institution.

Figure 57 European countries euro - non euro



Countries within the EC with their own currency

Countries within the EC with the euro

Figure 58 Comparison of euro vs non euro countries on selected variables

Country cluster	Cash in circulation per capita	Cash transaction volume per capita	Cash vs non cash (ratio)	ATMs per 100,000 capita	# ATM with-drawals per capita	€ ATM with-drawals per capita per annum	Avg value per ATM withdrawal	Branches per 100,000 capita	Total cards issued per capita	POSs per 100,000 capita	Account at a formal financial institution (%, age 15+)
Euro	2.406	328	62,6%	105,0	24,5	€ 3.078,10	€ 125,61	56,2	1,43	2.052	90,09%
Non-Euro	882	263	67,4%	76,2	27,2	€ 2.483,21	€ 91,37	50,1	1,66	1.788	78,87%
Delta	+1.524	+65	-5%	+28,76	-2,7	+€ 594,89	+€ 34,24	+6,1	-0,23	+264	+11%
Delta %	+63%	+20%	-8%	+27%	-11%	+19%	+27%	+11%	-16%	+13%	+12%

Source: G4S analysis based on ECB statistics

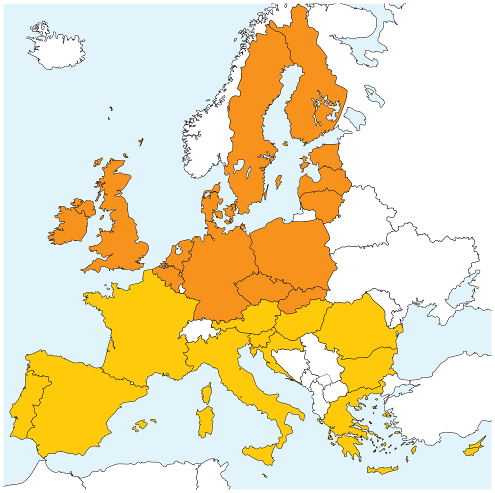
3.2.2 North vs South

As a second analysis the northern European countries have been analysed for their scores against the southern European countries.

The analysis shows that these groups of countries significantly differ on the following variables:

As becomes clear from the above overview there are many differences between the northern and the southern European countries of the EU28. Cash transaction percentages are much lower in the northern European countries, while cash in circulation is almost similar. Southern countries have better access to cash, both via ATMs and bank branches per capita, however northern countries perform more ATM withdrawals per inhabitant, albeit with a lower average value per transaction. While northern countries have more cards issued per person, southern countries have more POS terminals to use them.

Figure 59 European countries north - south



Southern European countries

Northern European countries

Figure 60 Comparison of northern vs southern EU countries on selected variables

Country cluster	Cash in circulation per capita	Cash transaction volume per capita	Cash vs non cash (ratio)	ATMs per 100,000 capita	# ATM with-drawals per capita	€ ATM with-drawals per capita per annum	Avg value per ATM withdrawal	Branches per 100,000 capita	Total cards issued per capita	POSs per 100,000 capita	Account at a formal financial institution (%, age 15+)
EURO	1.939	289	55,5%	81,7	30,2	€ 3.257,83	€ 107,73	51,2	1,74	1.663	91,2%
Non-EURO	1.912	327	74,7%	110,9	20,2	€ 2.503,35	€ 124,02	57,5	1,25	2.291	86,0%
Delta	27	38-	-19%	-29,19	+10,1	+€ 754,48	-€ 16,29	-6,3	0,49	-628	+5%
Delta %	1%	-13%	-35%	-36%	+33%	23%	-15%	-12%	28%	-38%	+6%

Source: G4S analysis based on ECB statistics

3.2.3 East vs West

As a final analysis the eastern European countries have been grouped against the western European countries.

Our analysis shows that while eastern countries rely more heavily on cash to perform their payments, cash in circulation per capita is significantly higher in western countries. This may be explained by the differences in the cost of living. When it comes to access to cash, eastern countries have better access to bank branches, while western countries have almost twice as many ATMs per capita. Western countries also use these ATMs more often for cash withdrawals, yet the average amount per transaction is comparable. Western countries also have more cards per person, POS terminals per person, and more people with a bank account.

Figure 61 European countries east - west

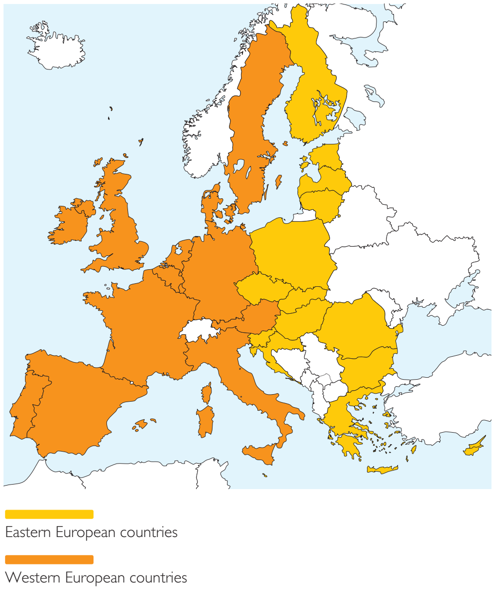


Figure 62 Comparison of eastern vs western EU countries on selected variables

Country cluster	Cash in circulation per capita	Cash transaction volume per capita	Cash vs non cash (ratio)	ATMs per 100,000 capita	# ATM with-drawals per capita	€ ATM with-drawals per capita per annum	Avg value per ATM withdrawal	Branches per 100,000 capita	Total cards issued per capita	POSs per 100,000 capita	Account at a formal financial institution (%, age 15+)
EURO	1.122	317	74,4%	56,3	17,8	€ 2.122,89	€ 119,22	72,6	1,04	1.158	80,30%
Non-EURO	2.178	305	52,8%	108,4	27,7	€ 3.131,65	€ 113,00	48,5	1,65	2.223	93,62%
Delta	-1.056	+12	+22%	-52,04	-9,9	-€ 1.008,75	+€ 6,21	24,0	-0,6	-1.066	-13%
Delta %	-94%	+4%	+29%	-92%	-56%	-48%	+5%	33%	-59%	-92%	-17%

Source: G4S analysis based on ECB statistics

3.3 Qualitative country differences

3.3.1 Legislation – regulation

As established in previous chapters the overall ambition of Europe is to create an integrated, single market. For cash usage, this has largely become a reality with the introduction of the euro. Obviously, adding more countries to the eurozone will further support this integration.

For cash logistics, however, the market is still very fragmented. The regulation on cross-border transportation of euro cash by road (cash in transit – CIT) commenced on 30 November 2012. The purpose of the regulation is to ensure that euro banknotes and coins can be easily and safely transported by road across national borders between member states that have adopted the euro or are about to do so[53].

Cross border CIT

The main principles for cross-border CIT are to have easier cross-border transport of euro cash within the euro area, common rules for the euro area and high level of security for the CIT-staff and the general public. These principles will be applying to 19 euro-area countries and to Andorra, Monaco, San Marino. An overview of cross-border CIT licenses[54] is shown in figure 63.

The countries with land borders in eurozone without licensed cross-border CIT[55] are

Figure 63 Overview of cross-border CIT licenses (2015)

Country	Nr of licenses 2014	Nr of licenses 2015	Expiry
Germany	5	6	2018
Spain	2	2	2018
France	2	3	2018/2019
Austria	1	1	2018
Slovakia	1	3	2018
Netherlands	1	1	2018
Slovenia	-	5	2019/2020
Total	12	21	

Source Presentation Rüdiger Voss, EC, ESTA Conference Berlin, 2015

Portugal, Italy, Belgium, Luxembourg, Estonia, Latvia, Slovenia

Countries without land borders in Eurozone without licensed cross-border CIT[56] are Finland, Greece, Ireland, Malta, Cyprus

Even though the number of CIT companies with a cross-border license is growing, the absolute number is limited. Furthermore, based on insights from our stakeholder interviews, in practice effectiveness, usage of the license as well as the need for improved cross border CIT is limited as well.

Besides lacking the need for further integration or cross-border CIT, there are also a number of other, more practical cross-country limitations:

1. Language differences
2. Wage differences
3. Transport arrangements and role of the police
4. Type of allowed vehicle (armoured, homologated IBNS)
5. Rules on fire arms for CIT

53 ec.europa.eu/economy_finance/euro/cash/transport/index_en.htm
54 Presentation Rüdiger Voss – ESTA July 1st 2015
55 Rüdiger Voss 2014/2015
56 Presentation Rüdiger Voss – ESTA July 1st 2015

3.3.2 Cash Cycle

The organisation of activities in cash logistics is commonly referred to as the cash cycle. Even though the activities performed in any cash cycle are largely generic across countries, the way in which this is organised and which party is responsible for carrying out a particular activity vary widely across European member states.

All these differences in cash cycle organisation find their origin in specific country aspects such as: history, culture, geographical aspects, regulation etc.

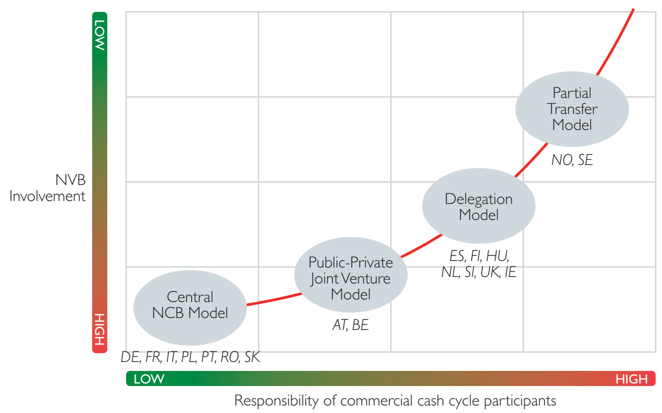
The level of efficiency is largely determined by the setup of the cash cycle, in terms of number of players at each level, the activities that they perform, and the way in which the cash cycle is governed.

Important factors are:

- The level of operational involvement of the NCB or the necessity to physically transport cash to and from the NCB premises. Some countries have already reduced the role of the NCB, facilitated by mechanisms such as Notes Held To Order (NHTO) or Balance Sheet Relief (BSR).
- The level of cooperation between commercial banks and CITs to support matching of supply and demand of notes and coins.

2 The level of recirculation of cash in the market.

Figure 64 Cash Cycle Models



Source EPC 037-2013, Improving the efficiency of the handling of cash - Cash Cycle Models

The EPC, in cooperation with the ESTA, has analysed the cash cycles of European countries and categorised these into 4 "generic" cash cycle models[57] (figure 64):

Centralised Model:

The NCB plays a pivotal role in the cash distribution cycle at national level, acting - through its branch network - as the primary warehouse, distribution centre and processor of cash.

Joint-Venture Model:

A joint venture company is established between the NCB and PSPs (both acting as financial shareholders). This joint venture company deals with all aspects of wholesale cash activities on a lower operational cost basis when compared to the centralised cash cycle model. Such joint venture model would have to comply with requirements set by national competition authorities.

Delegation Model:

The NCB delegates some cash handling activities such as authentication checks, fitness sorting and

57 EPC037-2013: Improving the efficiency of the handling of cash - Cash Cycle Models

bundling to the commercial sector (PSPs and/or CIT companies).

Transfer Model
PSPs assume responsibility (and costs) for all wholesale cash functions. The NCB is no longer present within the cash supply cycle (except for issuing).

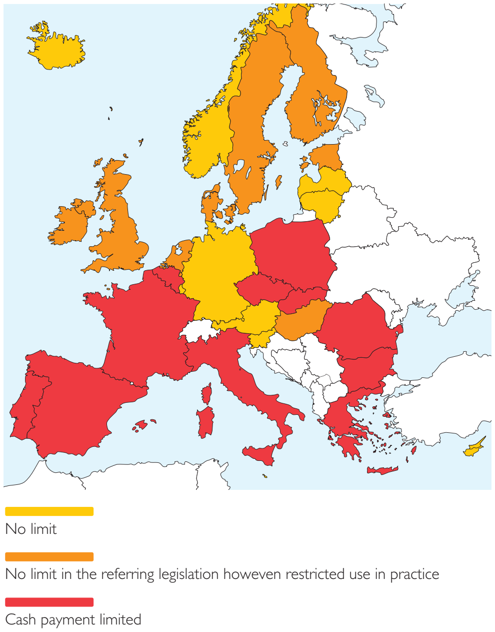
On the topic of cash cycle organisation a few observations can be made:
1. There are considerable variations in organising the cash cycle
2. The categorisation of these types of organisations seems to suggest that there is an ideal model. This is however disputed by the authors themselves. EPC: "there is no one size fits all as each country's specificities need to be considered when organising the cash cycle. We can only inform each country of the various options available to them and advocate that they organise themselves in the most cost-efficient way relevant to their country."
3. The idea that a single Cash Cycle for EU28 is feasible and that that would be the most cost efficient way to organise cash logistics across Europe, is quickly abandoned by all stakeholders as being only a 'theoretical alternative' given the high number of cross country differences that still exist on a multitude of related aspects.

3.3.3 Cash restrictions – Limits in amount for cash transactions

Across Europe various countries have set limits to the amount allowed to pay for with cash. This is done primarily as a counter measure to illegal and black market transactions. The effectiveness of these limits is debated as "upper cash thresholds are likely to have a negative impact on overall consumption (cash and non-cash) and also may even cause panic waves during economic turmoil[58].

Even so, and even though the limits set are high enough to exclude most day to day cash transactions, it does impose a restriction on the use of cash.

Figure 65 Limits in amount for cash transactions



Source European Consumer Centre France www.europe-consommateurs.eu/en/consumer-topics/buying-of-goods-and-services/cash-payment-limitations

58 Source: Edoardo Beretta, PhD - The irreplaceability of cash and recent limitations on its use: why Europe is off the track. International cash conference on "The usage, costs and benefits of cash revisited" Deutsche Bundesbank, Dresden (D), 15-18 September 2014. https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2014_09_16_cashs_irreplaceability_and_recent_limitations_on_its_usage.pdf?__blob=publicationFile

The lowest limit set is found in Italy, where cash transactions are limited to 999.99 euro[59].

3.3.4 Cash restrictions – Charges for ATM withdrawals

A second restriction comes from charging for ATM withdrawals[60]. Not all countries have this policy, however an increasing number of countries do impose charges for ATM withdrawals, particularly for withdrawing funds from an ATM of another bank rather than your own ("guest usage").

These charges vary widely between countries, or even between individual banks within a country. Highest fees for ATM withdrawals are charged in Poland (3-4% of amount)[61], Germany (up to 5 euro per transaction) and United Kingdom (up to 10 GBP per transaction, for specific transactions).

Banks defend these charges by stating that providing (interbank) ATM services is not free, and that these costs need to be compensated. As already mentioned in this report the European consumer organisation BEUC strongly opposes this point of view. BEUC finds it unacceptable that consumers have to pay to get access to their own money, especially when they are obligated to deposit this money/their salary on a bank account.

59 European Consumer Centre France

60 www.en.wikipedia.org/wiki/ATM_usage_fees

61 European Consumer Centre France - www.europe-consommateurs.eu/en/consumer-topics/buying-of-goods-and-services/cash-payment-limitations

3.4 Cross-country comparisons – Initial Observations and Discussion

There are many differences between EU member states when it comes to the availability, access and use of cash.

In 20 out of 28 countries cash based transactions still represent over 50% of all payment transactions, and in all European countries except Denmark and Sweden cash is the largest payment instrument in terms of volume. In Denmark and Sweden cards are most used[62].

When comparing country clusters the most notable differences found are:
Euro vs non euro: cash in circulation is significantly higher in euro countries and the number of ATMs and bank branches per capita are higher. The ratio of cash vs non cash transactions is largely the same. Citizens of euro countries use their ATMs less often, but do withdraw higher amounts.

North vs south: Cash transaction percentages are much lower in the northern European countries, while cash in circulation is almost equal. Southern European countries score much higher on the number of POSs, ATMs and (to a lesser extent) bank branches per capita. Northern countries use the ATM much more frequently yet withdraw smaller amounts per transaction.

East vs West: Cash transaction percentages are much higher in eastern European countries,

62 The volume of eMoney transfers of Luxembourg, which should be attributed to Paypal bank and not to Luxembourg, is disregarded here.

while cash in circulation per capita is much lower. western European countries score higher on ATMs, bank branches and POSs per capita. Also the number of ATM withdrawals is higher in the western European countries, yet the average amount of a withdrawal is comparable.

Restrictions on the use of cash are in place in various countries, outlawing cash transactions above a certain amount. These limits vary from 999.99 euro (Italy) to 15,000 euro (Poland).

In addition, some countries charge for ATM withdrawals. Highest fees for ATM withdrawals are charged in Poland (3-4% of amount), Germany (up to 5 euro per transaction) and even though 97% of all cash withdrawals in the UK are free[63], in exceptional cases charges can run up to 10 GBP per transaction)"

63 www.link.co.uk

Cash transaction percentages do not seem to be correlated with the cash in circulation per capita. For instance in Luxembourg, Finland and The Netherlands, cash in circulation is relatively high while these countries have a relatively low percentage of cash transactions. And vice versa for Romania and Bulgaria, which have a low cash in circulation per capita and a relative high percentage of cash usage.

The data suggests there is no correlation between the level of access to cash (number of ATMs and branches of institutions offering payment services) per capita and the use of cash. Countries like France, Portugal, Spain, UK and Germany score high on ATMs per capita yet do not top the chart for cash usage.

Apparently, a country's payment profile is determined by many different variables. These variables include measurable items (such as Cash in Circulation, the availability of electronic payment instruments or infrastructure), as well as non-measurable items, including a country's historic cultural, political and legal situation and its population's habits and customs.

This complex myriad of drivers make it very difficult to find clear correlations between one single variable and the usage of cash, which would potentially allow us to fully understand and moreover predict the future of cash in a certain country.

At the same time, given that the payment habits of a country are also largely defined by these more subjective and qualitative drivers, which are predominantly outside the direct remit of the financial sector (or any sector for that matter), changing this payment behaviour in one direction or another will most likely prove to be "difficult".

The ECB and the national central banks (NCBs) of the Eurosystem are committed to supporting cash as a generally available, easy-to-use, reliable and efficient means of payment for retail transactions

Ton Roos
ECB

This means that the usage of cash is strongly anchored in a country's history and therefore, despite the clear trend towards electronic payments, this change will not necessarily go as fast as some might suggest or even prefer.

Cash cycle organisation differs per country with different governance models in place to organise cash logistics. The efficiency of a cash cycle is largely determined by:

1 The level of operational involvement of the NCB
2 The level of cooperation between commercial banks and CITs
3 The level of recirculation of cash in the market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UNDERGROUND
Great Portland Street 453
UNDERGROUND

4 Cash in Europe – future scenarios

What will the future hold, or perhaps even better: what could the future hold for payment transactions in Europe? Will electronic payments, for instance via mobile phones, completely replace cash, or will cash still hold its value and its place in our society? It is clear that the future of payment transactions and cash is very uncertain still. Different drivers and trends are at force, such as the drive for an integrated Europe, digitalization and innovation, and these will all influence the future development of cash usage and cash logistics in Europe.

> *Cash has been there since 800 BC. There are not that many products that have been around for that long. I can think of two: one is cash and the other is the wheel. I doubt that we will ever see a wheel-less society either*
>
> Thierry Lebeaux
> ESTA

One way to get an idea of the future of cash is to create different future scenarios.

Scenarios provide the answer to the question of how a hypothetic situation can emerge step by step and which intervention options exist in order to prevent, change the direction of or merely simplify the developments. When creating scenarios it is important to keep in mind that the truth and the facts are not the central factors, but that it is simply a matter of having a communication process and dialogue between people. When planning scenarios, it is important that different types of factors are taken into account, including the fact that most of these may change or be more relevant in the near future.

Through scenario planning we don't claim to be able to predict the future, yet rather imagine possible futures and describe these. These descriptions then allow each stakeholder to position itself in a given scenario and determine the impact that would have on its current role and strategic choices.

Simultaneously, scenario planning allows us to plot relevant events that are actually occurring in the world around us today and use these as indicators to show us in which direction our industry is evolving. Ultimately, it allows all stakeholders to think out-of-the box, and imagine possible futures, assess likelihood and prepare and position itself for any future.

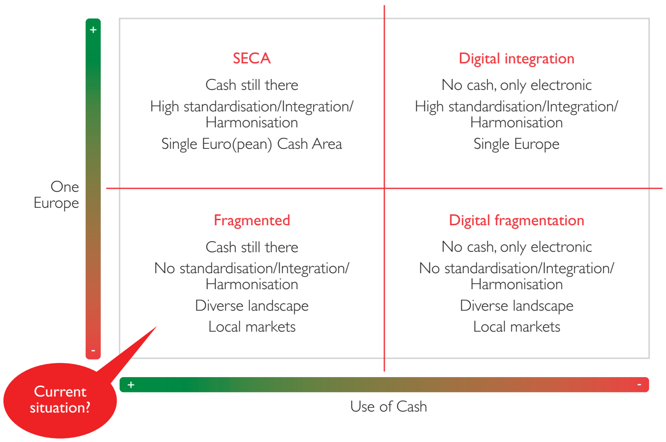
4.1 Future Scenarios

Through analysis of the key drivers and trends observed in the cash market today (as descibed in paragraphs 2.2, 2.3 and 2.4), we arrived at two central questions defining the future scenarios of cash and cash logistics:

1. What is the future of cash as a payment instrument? Will there still be cash in 20-30 years' time? Or will we have a truly cashless society?
2. Will Europe be truly integrated when it comes to the use of cash payments and cash payments logistics?

Based on cornerstone attributes of any payment instrument such as cost efficiency, availability, reliability and safety, the main drivers and trends impacting the future of cash are: the creation of a single Europe, digitalization, social & financial inclusion, innovation & new entrants.

Figure 66 4 Potential future scenarios of cash



Source: G4S & PAG (2015)

Based on this, four potential scenarios are conceivable as shown in figure 66. As stated, the scenarios are based on the extreme answers to the two central questions, only with the objective to clearly create different worlds and stimulate the discussion. Again, it is not the intention or objective to present a realistic future per se. The four scenarios are then described as follows:

Fragmented cash

In this scenario, cash is still present in our society as a legal means of payment. There is no integration on European level. Domestic laws and operational regulations are still prevalent. There is high diversity between European countries when it comes to the use of cash and cash handling. By and large, this scenario represents the current situation for the cash market across Europe today, in particular when it comes to cash logistics.

Single European Cash Area (SECA)

In this future, cash is still present as a legal means of payment. There is however full integration across Europe in terms of rules and regulations. Effectively this represents the scenario that SECA pursues with an extended country scope to include Euro and non-Euro countries across the European Union or even Europe.

Digital Integration

In this landscape, digitalisation has taken over and cash has been fully replaced by electronic means of payment: effectively creating a cashless Europe. Furthermore, all rules and regulations have been synchronised across Europe: effectively creating a single market place for (electronic) payments services.

Digital Fragmentation
In this society, digitalisation has taken over and cash has been fully replaced by electronic means of payment: effectively creating a cashless Europe. However, there is no integration on European level. Domestic laws and operational regulations are still prevalent, yet this is only relevant for non-cash payments, as cash payments no longer exist in this scenario.

During the stakeholder interviews for this report we presented these four scenarios. The key stakeholders in the European cash market and the cash cycle are:

1. Central Bank(s)
2. Commercial Bank(s)
3. CIT/CMC companies
4. Consumers
5. Retailers
6. European Commission

In our stakeholder interviews the topics were recognized and validated as essential drivers and central questions in our industry. Stakeholders also mentioned other influencers such as: innovation and technology, political and economic developments. These related variables will be included in the scenario descriptions of the four scenarios.

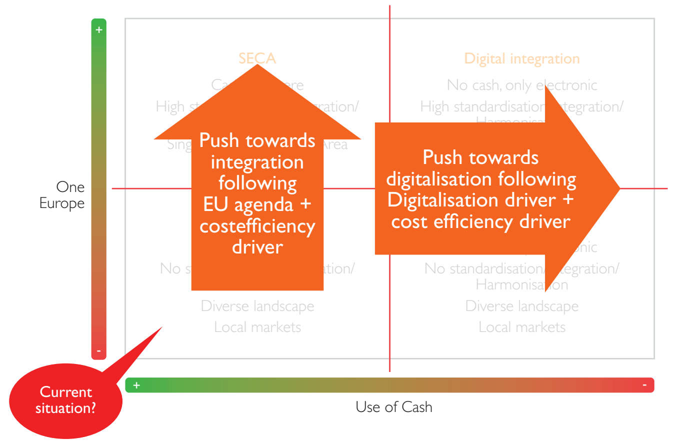
Each potential future scenario provides different circumstances for each stakeholder to cope with. Each stakeholder needs to think about how these changed circumstances will influence their role and position in this market and how it should/could anticipate now in order to maintain or even improve its position in the future.

Obviously, further analysis is needed in order to fully prepare for any future.

Drivers towards EU integration and electronic payments
Based on our analysis and stakeholder interviews, it seems clear that there are drivers pushing towards a more integrated and digitalised Europe. In particular the drive towards a single Europe pushes us towards the top part where Europe is actually fully integrated. This goes for cash as a payment instrument (more countries adopting the single currency) as well as for cash logistics.

In addition: the trend towards Digitalisation pushes us away from cash towards the use of more electronic means of payment. Moreover, also innovation and new entrants bring in more and more electronic alternatives to cash payments. Finally also regulation to ensure all Europeans have access to a bank account with basic features

Figure 67 Drivers towards domestic markets and cash payments



Source: G4S & PAG (2015)

will have a positive effect on the use of electronic payment instruments. This would indicate that we are heading towards the digital integration future scenario (figure 67).

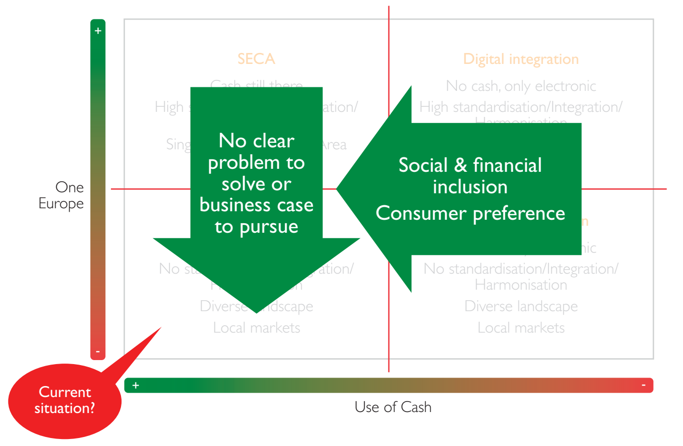
Drivers towards domestic markets and cash payments

However, there are also many arguments to the contrary, such as: social and financial inclusion and consumer preferences (driven by privacy concerns, or reasons of budget control, or simply because of habit). As we have seen the financial inclusion across Europe (measured in percentage of population with a bank account) varies widely, and even in highly developed countries (with a percentage nearing 100%) the availability and reliability of cash is even higher. Moreover, ultimately it is the consumer who determines which means of payment he/she wants to use. And as long as consumers want to use cash, the ECB will facilitate this.

Also ESTA is convinced that Cash will still be around in the future, as Thierry Lebeaux states: "Cash responds to a human and social need that will not go away. Cash will remain. Cash has been there since 800 BC. There are not that many products that have been around for that long. I can think of two: one is Cash and the other is the wheel. I doubt that we will ever see a wheel-less society either." ESTA then concludes: "As long as cash fulfils a need we will still have cash."

Additionally, there are also indicators that further integration of cash and cash logistics is not required and expected, as underlined by most stakeholders.

Figure 68 Drivers towards domestic markets and cash payments



Source: G4S & PAG (2015)

The European Commission states: "The 2011 Regulation on cross-border CIT provides for a more level playing field in European CIT. Therefore, no one is knocking on our door to come up with more legislation in this field. Only after the revision of the Regulation foreseen by law for next year and discussions held with stakeholders, the Commission could kick off initiatives for further integration of cross-border CIT if results showed that there is a glaring need for more. We aren't there." This is confirmed by both the European Consumer organisation (BEUC) and the European Retailers organisation (EuroCommerce).

This is also what BEUC indicates: "as far as we are concerned, Europe is already largely integrated when the Euro was introduced. Adding more countries to the Eurozone, will only further improve on this". EuroCommerce adds: "we don't have a direct need for further cross-border integration of cash logistics".

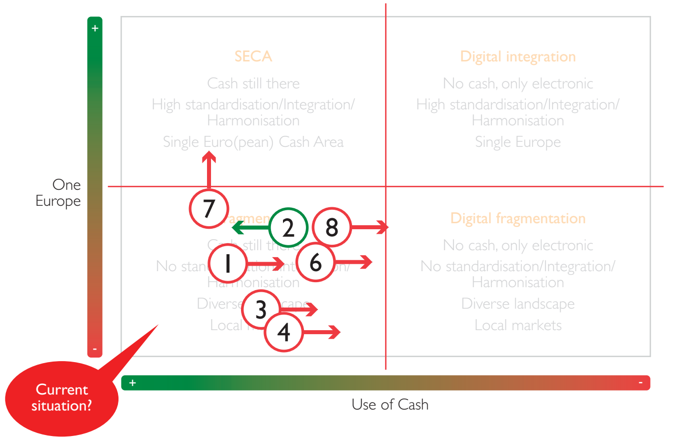
Current data-points as indicators for future development

Following these deliberations we cannot say how this is going to develop in the future.
Perhaps analysing the relevant trends and data points currently present in our market could provide pointers for the direction of future development. These trends and data points include:

1 The ratio of cash vs electronic is declining. Apparently across EU28, the consumers are choosing more and more for electronic payment means and less for cash, for a variety of reasons as discussed previously in this report. Regardless of these reasons, the trend is undeniable and this indicates a move towards the right hand side of the 2x2 matrix
2 Cash in circulation is increasing year on year
3 Number of cash distribution points is declining
4 Initiatives towards a cashless society (in a number of Scandinavian countries)
5 Legal tender status of cash debated
6 Many new digital payment means enter the market
7 Legislation to further integrate EU for CIT, cross-border CIT
8 Regulation to ensure everyone has access to electronic payment infrastructure (bank account with basic features)

Figure 69 shows these data points they seem to indicate the development towards a more digitalised payment environment.

Figure 69 Drivers towards domestic markets and cash payments



Source: G4S & PAG (2015)

4.2 Conclusions

Following the discussion above we cannot clearly predict, nor was this the objective, the future for cash in Europe. Key data points seem to indicate that there is a trend away from cash and towards a more integrated Europe. However, whether this trend continues in the same direction and how far it will take us in this initial direction remains to be seen.

It is clear that the cash market is clearly developing and that stakeholders should be aware of the underlying dynamics (drivers, trends) as well as the actual data points/indicators in our present world. This will allow them to anticipate future developments, (re-)position themselves and maintain or even improve their place in the cash and cash logistics industry.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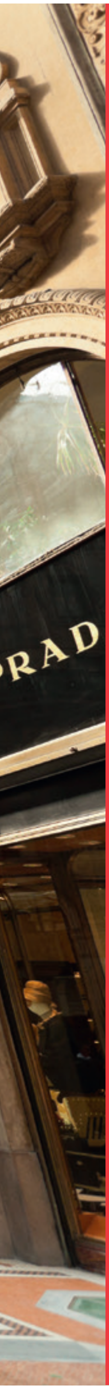
5 Cash in Europe – Key findings and closing remarks



The main observation from our earlier reports for The Netherlands (2011) and Belgium (2013) is confirmed in this pan European Cash report: cash still is by far the most widely used payment instrument (also) in the European Union. In other words: Europeans rely for the most part on cash for their day to day payments and, consequently, cash (and the provision of cash through the cash cycle) plays an essential role in the European economy.

> *...there shouldn't be any competition between cash versus non-cash, nor should it be an either/or proposition. There is just a need to make payments in all circumstances and this need is fully fulfilled by both cash and non-cash payment instruments.*
>
> Cash Report 2016

A second important observation is that, when it comes to providing and organising payment services, cash and cash logistics, the objectives of each EU country are largely the same. Each country aims to provide cost efficient, reliable and available payment services. However, the way each country organises itself to achieve these objectives differs greatly per country. Furthermore, cash logistics is largely organised within national borders, with good reason and with very limited apparent need among most stakeholders for further integration.

The overall conclusion is that the European Union market for cash and cash logistics can be characterized as dynamic, differentiated and fragmented, with a underlying and shared objective to deliver efficient, reliable and safe payment services to the European market.

5.1 Key Findings

As this report shows there are many differences between EU member states, even though the objectives of each country when it comes to organising its payments landscape are largely similar. With the euro as the single currency in 19 EU countries this is the most standardised aspect in the European cash market. At the same time (still) 9 other currencies exist within the EU.

5.1.1 On the use of cash as a payment instrument

The differences between countries are even more apparent when it comes to the use of cash as a payment instrument and the availability and use of alternative (electronic) payment instruments and infrastructure.

Cash is by far the most used payment instrument in the European Union; 60% of all payment transactions are conducted in cash. When limited to a consumer-to-consumer or retail environment, where cash is commonly most used, this percentage would be even higher. In 20 out of 28 countries, cash represents more than half of total payment transaction volumes.

A quick assessment of the research data shows that by and large cash is used most in the south eastern part of the EU, while the north western countries rely more on electronic payment instruments. At the same time, as stated before, cash is the most dominant payment product in terms of volume in all countries in the EU, except for Denmark and Sweden.

Restrictions on the availability and use of cash are present in a number of EU countries (limit on the amount for a cash transaction, charges for ATM withdrawals), and the levels of these restrictions vary per country.

Cash volumes are difficult to establish exactly, yet growth in key indicators, such as: Cash in Circulation (measured in value, volume and as a share of total GDP), Number of ATM withdrawals and value of ATM withdrawals, seems to suggest that cash transaction volumes could also be increasing. However, the relative share of cash in the total payment volume is declining, with the growth in card payment volumes contributing most significantly to this shift.

Analysis on the key attributes (valued assets) of payment instruments shows that cash uniquely covers a range of valued assets, while other valued assets (not covered by cash) are covered by a multitude of electronic payment instruments. This is known as the imperfect substitutability of payment instruments. It can be concluded that as long as these attributes (valued assets) are only fulfilled by cash and not by any other alternative, cash will fulfil a need and therefore will remain a widely used payment instrument.

Availability and reliability of and access to the non-cash payment infrastructure (cards issued, POS terminals, bank account access, etc) is growing across Europe, but differ widely between EU member states.

On the cost of cash: like electronic payments cash incurs a high fixed cost component, which means that cost per transaction is highly dependent on the transaction volumes.

Recent ECB and EC studies concluded that cash is less expensive than electronic payments both for society as a whole ("On average, cash payments show the lowest social costs per transaction, followed closely by debit card payments") and also for retailers in particular ("…merchants in the sample would be better-off, on average, if the transactions currently executed with cards were carried out by cash").

Based on the above one could argue that there shouldn't be any competition between cash versus non-cash, nor should it be an either/or proposition. There is just a need to make payments in all circumstances and this need is fully fulfilled by both cash and non-cash payment instruments.

Stakeholders seem to be increasingly aware of the apparent value of cash in our society as the overall sentiment seems to move away from "war on cash" and drive towards a "cashless society" to a more open viewpoint: "The world cannot do without cash".

This leads to a more balanced debate on how to best organise payments in general (both electronic and cash payments included) to the benefit of our society.

5.1.2 On cash logistics and cash cycle organisation

The differences between EU member states are most apparent in Cash Logistics and the way the Cash Cycle is organised. Cash logistics is largely organised within national borders with the regulation for cross-border CIT providing a framework to provide cross-country services under a single license. Most stakeholders challenge the effectiveness and need for this regulation and relatively few CIT companies have applied for this license.

For cash cycle organisation the objectives are largely similar (cost efficiency, reliability and availability of services), but the actual organisation of the cash cycle differs per country. Each country's specific history, language, laws, regulations and customs explain these differences in cash logistics organisation. Consequently, cash logistics (efficiency) optimisation is pursued within national borders.

The main drivers behind this efficiency optimisation seem to be the level of involvement of the National Bank in the operational activities in the cash cycle and the level of recirculation of cash in the open market (i.e. recirculation by consumers/retailers/CITs).

An overall trend seems to be that NCBs are withdrawing from active participation in cash cycle operational activities, which leads to an increasing share of activities performed by commercial banks and CIT companies.

CIT companies are slowly moving up the value chain with some CIT companies already operating as a CMC (Cash Management Company), providing value-adding services in addition to pure cash logistics activities. These services include: monitoring/forecasting, providing Same Day Credit, 'smart vaults', etc.

Additionally, repositioning in the value chain is facilitated by EU regulations such as, PSD and the upcoming PSD2, allowing CIT companies (and other companies) to become a "Payment Institution" (PI) or "third party payment service provider" (TPP). Besides the opportunity to provide additional services, this also means that these parties come under more direct oversight.

This also opens the door for new entrants into this market, with most of these focussing on the electronic payment domain, rather than the cash market, yet still with a potential effect on the cash market.

5.1.3 On the future of cash and cash logistics

Besides establishing what the current payment landscape looks like in Europe and what the position of cash is in that landscape, one of the central questions in this report was what the future position of cash would or could be in the European payment landscape.

As described in this report there are many trends and developments driving the way European citizens pay for their goods and services and how we organise cash logistics. These vary from the overall objective to create a single Europe to digitalisation, regulation, standardisation and innovation.

As our analysis, including stakeholder interviews, shows, it is expected that cash will remain a valued and essential payment instrument in the European marketplace and that further integration on a European level is likely, yet limited. Adding more countries to the euro area will obviously further standardise Europe when it comes to cash, but cash logistics and the organisation thereof will most likely remain a national sovereignty.

5.2 Closing remarks & Food for thought

Notwithstanding the insights we have presented in the current situation of cash and cash logistics throughout the European Union, and the outlook presented through the scenario analyses, the big question remains: how will cash develop in the future? Which trends and developments will have the most impact on the future of cash?

It is expected that the further improvement in availability of and access to the electronic payment infrastructure will have an impact on the growth of electronic payment volumes (primarily cards) and thereby also impact the ratio between cash and non-cash payments. As we've seen this is already growing significantly in Europe, but there still is (much) room for further growth in many of the individual EU member states.

It will be particularly interesting to see what the impact will be of Directive 2014/92/EU, which includes the right to all consumers to have access to a bank account with basic features, including a payment card as of next year (2016).

Key stakeholders seem to embrace this point of view as the anti-cash sentiment ("War on cash") seems to have changed to a more open viewpoint: "The world cannot do without cash"

Cash Report 2016
Key Findings Cash Report

Based on the scoring of payment instruments (cash and non-cash) on valued key attributes we observed that cash uniquely covers many valued attributes. From that, we concluded that the future of cash is secured as long as this remains the case. When looking at this from the opposite perspective, one could argue that, as soon as an (electronic) alternative payment instrument becomes available covering (more of) the valued attributes that are now uniquely covered by cash, we could expect a shift away from cash.

The developments in instant payments, mobile devices, tap & go and peer-to-peer functionality are all very relevant in this regard.

This is also related to another unique attribute of cash: the legal tender status of cash. This status, at least in the perception of the general public, guarantees that cash can be used anytime and anywhere as a means of payment. Recent occurrences of self-proclaimed cashless shops can for now be labelled as isolated and local initiatives and condoned as 'contractual freedom'. However, as soon as these occurrences become more frequent and less isolated, it remains to be seen whether this position can be maintained.

But as long as this is not the case, and cash (uniquely) covers valued attributes then cash will remain an important cornerstone of our economic society for years to come. From a user's perspective one could argue there shouldn't be any competition between cash versus non-cash, nor should it be an either/or proposition. There is just a need to make payments in all circumstances and this need is fully fulfilled by both cash and non-cash payment instruments.

Key stakeholders seem to embrace this point of view as the anti-cash sentiment ("War on cash") seems to have changed to a more open viewpoint: "The world cannot do without cash". This leads to a more balanced debate on how to best organise payments in general (both electronic and cash payments included) to the benefit of our society.

6 Country Pages

For the Country Pages the following sources have been used. In certain instances a different source had to be used; if so, this is mentioned explicitly in the country page.

Macroeconomic information	
Population	ECB Statistics 2014
GDP	ECB Statistics 2014
GDP per capita	ECB Statistics 2014
Income level OECD index	World Bank 2014
Currency in circulation outside MFIs (xMio Eur)	ECB Payment Statistics 2014; NCB annual reports 2014
Currency	
Key figures Cash	
% cash	The Social and Private Costs of Retail Payment Instruments 2012
Cash transaction volume	ECB statistics + The Social and Private Costs of Retail Payment Instruments 2012
ATMs	ECB Payment Statistics 2014
POS terminals	ECB Payment Statistics 2014
Cards issued per capita	ECB Payment Statistics 2014
ATM withdrawals - value	ECB Payment Statistics 2014
ATM withdrawals - number	ECB Payment Statistics 2014
MFIs offering payment services	ECB Payment Statistics 2014
Offices of MFIs offering payment services	ECB Payment Statistics 2014
NCB Branches	ECB Payment Statistics 2014
% Population with at least 1 bank account	Statista.com 2015
Internet penetration	World Bank 2015
Payment Instrument Mix	
Figure Payment Instrument Mix: G4S analysis based on The Social and Private Costs of Retail Payment Instruments: A European perspective, by Heiko Schmiedel, Gergana Kostova and Wiebe Ruttenberg, 2012; + ECB Payment Statistics 2012	

Countries of Europe in this survey

Austria

Macro economic figures	
Population	8.540.000
GDP	329,30 Bio Euro
GDP per capita	€ 38.560 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	26.237 Mio Euro
Currency	Euro

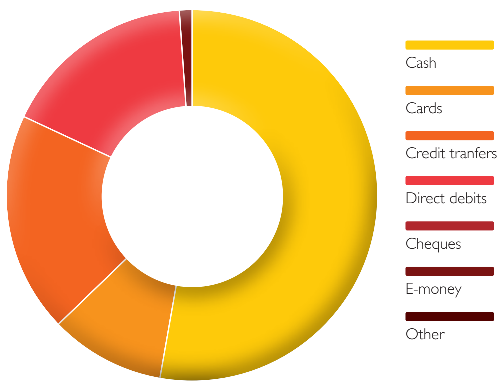
Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	52,52%		19
Cash transaction volume	2.684 Mio		13
ATMs	8.720	+1,57%	
	102,1 per 100.000 capita		6
	104,0 per 1.000 km^2		10
POS terminals	122.110	-0,21%	
	1.429,86 per 100.000 capita		18
	1.456 per 1.000 km^2		15
Cards issued per capita	1,42	+2,46%	14
ATM withdrawals - value	€ 5.338,41 per capita		1
ATM withdrawals - number	30,2 per capita	+12,79%	4
MFIs offering payment services	712	n/a	3
Offices of MFIs offering payment services	4.955		
	58,0 per 100.000 capita		
NCB Branches	3		10
% Population with at least 1 bank account	97,10%		7
Internet penetration	80,62%		10

Austria was one of the first countries to re-structure its cash cycle organisation by establishing a public-private partnership between de Österreichische Nationalbank (OeNB) and the commercial banks: Geld Services Austria. GSA performs most operational tasks within the cash cycle on behalf of the founding partners.

Cash and other Payment Instruments

53% of all transactions in Austria is done in Cash. For transactions between 50 and 100 Euro the share of Cash increases to 70.9% and for transactions under 10 Euro the share is 95.7%. Card transactions take a relatively small share (10%) while Credit Transfers (19%) and Direct Debit (17%) complete the picture.

Payment Instrument Mix



Austrians score high when it comes to the number of ATM withdrawals per annum (4th) and lead the EU28 in the annual amount withdrawn per capita.

The Cash Cycle

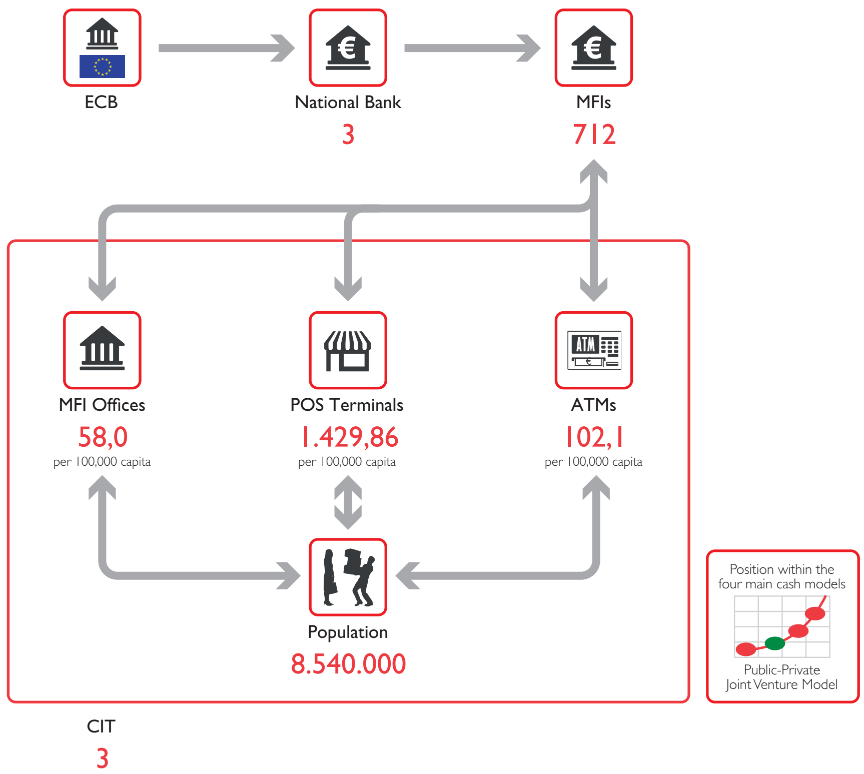
Austria was one of the first countries to restructure their cash cycle into a more centralised model. With the acquisition by the Östereichische National Bank) OeNB in 1999 Geld Services Austria (GSA) was founded. The OeNB and the commercial banks of Austria cooperate and have joint responsibility for handling and re-circulating cash. This reduces costs at the level of both the OeNB and the commercial banks while upholding the regulatory functions of the OeNB and infrastructural functions of commercial banks in a smaller cycle.

Besides the Austrian market, GSA also services neighbouring countries like: Switzerland, Germany, Slovakia, Slovenia and the Czech Republic

Country specific regulations

There are no restrictions on the use of cash in payments in Austria. There are some banks that will charge a small percentage when withdrawing cash from an ATM with a card that has been issued by a different bank, but in general cash withdrawal is free.

The Cash Cycle in Austria



Latest developments

Austria was included in the Cross-Country Comparison study with Payment Diary Survey Data (2014). According to this study cash accounted for 82% of consumer transaction volume in terms of volume and 65% in terms of value.

Sources

» Cash Logistics in Austria and the Euro Area, Anton Schautzer, 2007.
» The Use of Payment Instruments in Austria: A Study Based on Survey Data from 1996 to 2011, Peter Mooslechner, Helmut Stix, Karin Wagner, 2012.
» John Bagnall, David Bounie, Kim Huynh, Anneke Kosse, Tobias Schmidt, Scott Schuh and Helmut Stix, "Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data", 2014.

Belgium

Macro economic figures	
Population	11.160.000
GDP	400,64 Bio Euro
GDP per capita	€ 35.900 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	33.113 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	54,42%		
Cash transaction volume	2.998 Mio		
ATMs	10.010	-5,74%	
	89,7 per 100.000 capita		8
	327,9 per 1.000 km²		2
POS terminals	183.210	+5,94%	
	1.641,67 per 100.000 capita		15
	6.001 per 1.000 km²		6
Cards issued per capita	1,97	+1,70%	5
ATM withdrawals - value	€ 3.984,77 per capita		4
ATM withdrawals - number	29,4 per capita	-2,90%	6
MFIs offering payment services	115	+1,42%	17
Offices of MFIs offering payment services	8.431*		
	75,5 per 100.000 capita	+8,39%	4
NCB Branches	5		9
% Population with at least 1 bank account	96,30%		11
Internet penetration	82,17%		8

* In 2014 this number increased with 3.345 from 5.086 in 2013 to 8.431. This can be explained by a change in counting methodology. ECB: From 2014 this number includes all places of business (also offices of independent agents).

54% of all transactions in Belgium are done with cash. When compared to the rest of the EU, Belgium scores high on ATMs per km² and the annual amount withdrawn from ATMs per capita. The NBB is still very active in the Belgian Cash Cycle operations, yet Belgium is developing towards a more efficient cash cycle as part of their overall "NBB 2020 strategic review exercise".

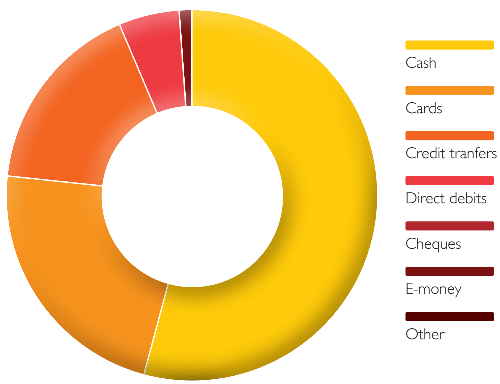
Cash and other Payment Instruments

The Belgian payment mix is a balance between cash (54%) and electronic payments (46%). Cards make up 22%, Credit Transfers 17% and Direct Debits another 5%.

Developments 2009-2014

The number of ATMs in Belgium has dropped

Payment Instrument Mix



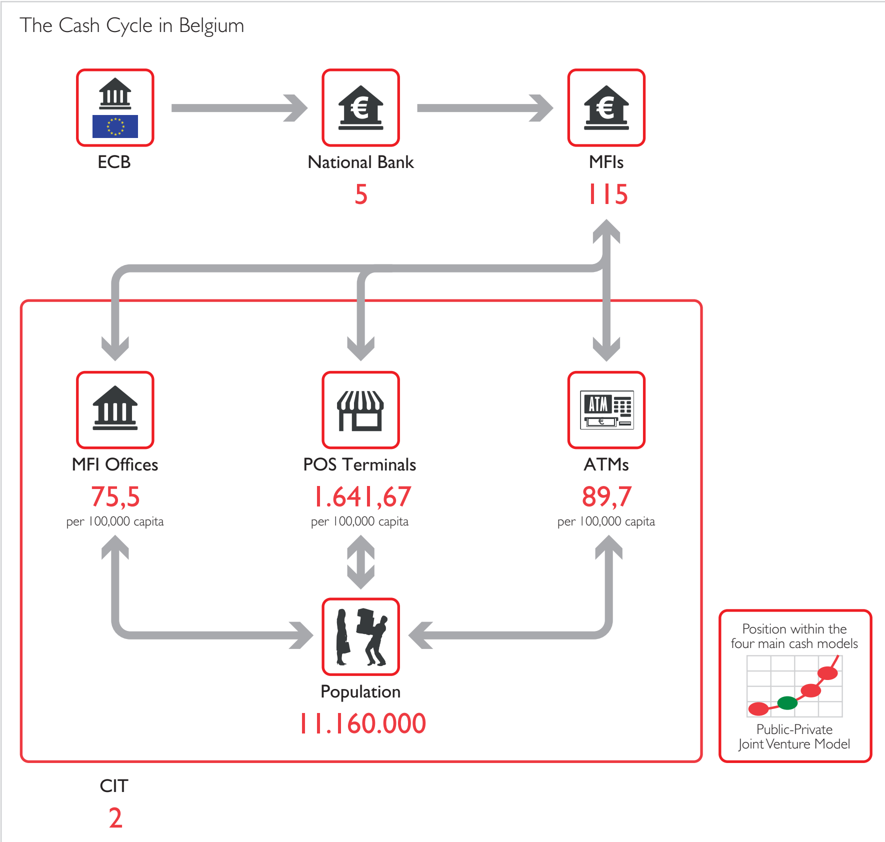
significantly in recent years (- 5.74%) whilst the number of offices of MFIs offering payment services increased significantly, especially in 2014 (+66% compared to 2013). POSs and Cards issued per capita increased with 5,49% and 1,70%, respectively.

The Cash Cycle

The Belgian cash cycle is controlled by the National Bank. All cash for recirculation has to pass through the National Bank, or one of its Cash processing centres. Belgium is developing towards a more efficient cash cycle set up, with consolidation banknote processing activities continuing. The network has already consolidated from 14 branches in 1999 to 4 today, and will comprise only the Liège and Kortrijk branches by the end of 2016, after the branches in Mons and Hasselt branches would close in 2016.

This consolidation is due to the steady decline in banknote related activities and a result of the increased automation of operations and the restructuring of banknote and coin handling in the banking sector.

By 2020, the NBB will no longer be printing banknotes but will buy them in. Tasks will also be reassigned between the NBB, the financial sector and the cash transporters. However, the Bank will still keep watch over the quality of the banknotes in circulation.



Country specific regulations

In 2012 a law was adopted stating that no payments above €5000,- can be made by cash anymore. This limit was further decreased in January 2014 to only €3000,-.

Sources

» NBB Report 2014, The National Bank as an enterprise

» National Bank of Belgium - Annual Report 2014

Bulgaria

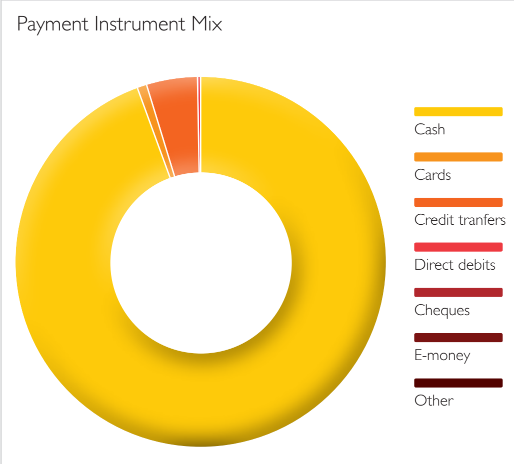
Macro economic figures	
Population	7.230.000
GDP	42,75 Bio Euro
GDP per capita	€ 5.913 Euro
Income level OECD index	Upper Middle Income
Currency in circulation outside MFIs	4.640,12 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	94,61%		2
Cash transaction volume	3.973 Mio		9
ATMs	5.620	+0,46%	
	77,7 per 100.000 capita		12
	50,7 per 1.000 km^2		21
POS terminals	76.250	+4,71%	
	1.054,63 per 100.000 capita		23
	688 per 1.000 km^2		21
Cards issued per capita	1,00	-0,21%	24
ATM withdrawals - value	€ 1.152,14 per capita		27
ATM withdrawals - number	13,5 per capita	-0,28%	25
MFIs offering payment services	38	+3,76%	26
Offices of MFIs offering payment services	4.660	-3,85%	
	64,5 per 100.000 capita		9
NCB Branches	7		7
% Population with at least 1 bank account	52,80%		27
Internet penetration	53,06%		27

Bulgaria ranks amongst the highest cash countries in the EU, with 95% of all transactions conducted in cash. Transactions are conducted in Bulgarian Lev, yet the country is preparing to introduce the Euro, which is one of the reasons why the Bulgarian National Bank (BNB) has been reorganizing the cash cycle set up in recent years.

Cash and other Payment Instruments

Bulgaria is one the most cash intensive EU countries, with 95% of all transactions done in cash. At the same time, Cards payment volumes are increasing fast in Bulgaria from 12.68 million (2009) to 65.24 million in 2014. Within the electronic payments domain Credit Transfers take by far the largest share (192,5 million and 61%).



Growth period 2009-2014

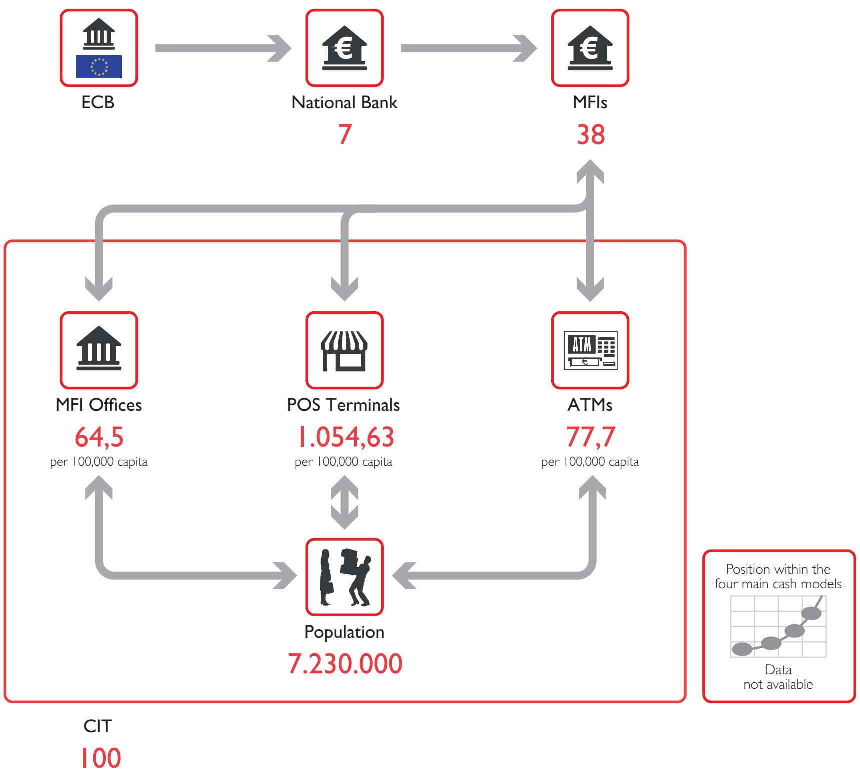
The number of offices of MFIs offering payment services has decreased (-23,13%), while the number of ATMs has remained largely stable for this period (+2,74%). On the other hand, the number of POSs has increased significantly (+28,3%), while the number of cards issued decreased (-5,92%). The increase in the number of POSs can only partly explain the sharp increase in the number of card transactions (+215,9%). The number of cash withdrawals decreased with 6,4%, suggesting a rapid shift from cash to cards in Bulgaria.

The Cash Cycle

The BNB plays a central role in the Bulgarian Cash cycle. In 2010 the BNBs new Cash Management Centres (CMC's) opened in Sofia, Varna, Burgas, Plovdiv and Pleven. Here cash handlers and commercial banks can all deposit their banknotes and coins to have them sorted, redistributed and destroyed.

By opening the CMCs the BNB has better view of the volumes of money in the cash cycle. It also provides valuable data to help with a smooth and efficient to the euro, in due time.

The Cash Cycle in Bulgaria



Country specific regulations

The limits on cash payments in Bulgaria are set to 14.999,- BGN (equal to EUR 7.670-). No further specific regulations were found.

Latest developments

Bulgaria is preparing for the introduction of the Euro replacing the Bulgarian Lev. Bulgaria already complies with four out of the five economic convergence criteria for euro adoption, only failing to comply with the criteria requiring the currency of the state to have been a stable ERM-II member for a minimum of two years. In July 2015, Bulgaria established a co-ordination council to prepare the country for Euro zone membership. Its main tasks are: drafting a national Euro introduction plan and determining the target date for euro adoption.

Sources

» Recent Developments of the Cash-Cycle in Bulgaria, Bulgarian National Bank, 2010
» Annual Report from BNB 2014
» National statistical Institute Bulgaria
» https://en.wikipedia.org/wiki/Bulgaria_and_the_euro

Croatia

Macro economic figures	
Population	4.230.000
GDP	43,02 Bio Euro
GDP per capita	€ 10.170 Euro
Income level OECD index	High Income (non OECD)
Currency in circulation outside MFIs	2.284,14 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	n/a		n/a
Cash transaction volume	n/a		n/a
ATMs	4.220	+2,43%	
	99,8 per 100.000 capita		7
	74,6 per 1.000 km^2		13
POS terminals	99.520	+7,92%	
	2.352,72 per 100.000 capita		11
	1.758 per 1.000 km^2		13
Cards issued per capita	2,00	n/a	4
ATM withdrawals - value	€ 2.432,62 per capita		18
ATM withdrawals - number	25,2 per capita	+10,71%	13
MFIs offering payment services	39	n/a	25
Offices of MFIs offering payment services	1.196		
	28,3 per 100.000 capita		20
NCB Branches	n/a		n/a
% Population with at least 1 bank account	88,40%		17
Internet penetration	66,75%		21

Croatia is the youngest member of the EU28 since they joined the Union in 2013. Not all relevant historic data was (publicly) available. Ranked 26, Croatia has a very low currency in circulation per capita. With 2,0 cards per inhabitant Croatia ranks 4th in EU28.

Cash and other Payment Instruments

Credit Transfers (44,51%) and Card payments (33,41%) account for most electronic payment volumes in Croatia (2014). From 2009 to 2013 the Internet penetration has increased from around 50% to well above 66%. The number of offices of MFIs offering payment services has decreased to a total of 1.196 and the number per 100.000 inhabitants now comes to 28,3; well below the EU28 average of 54.

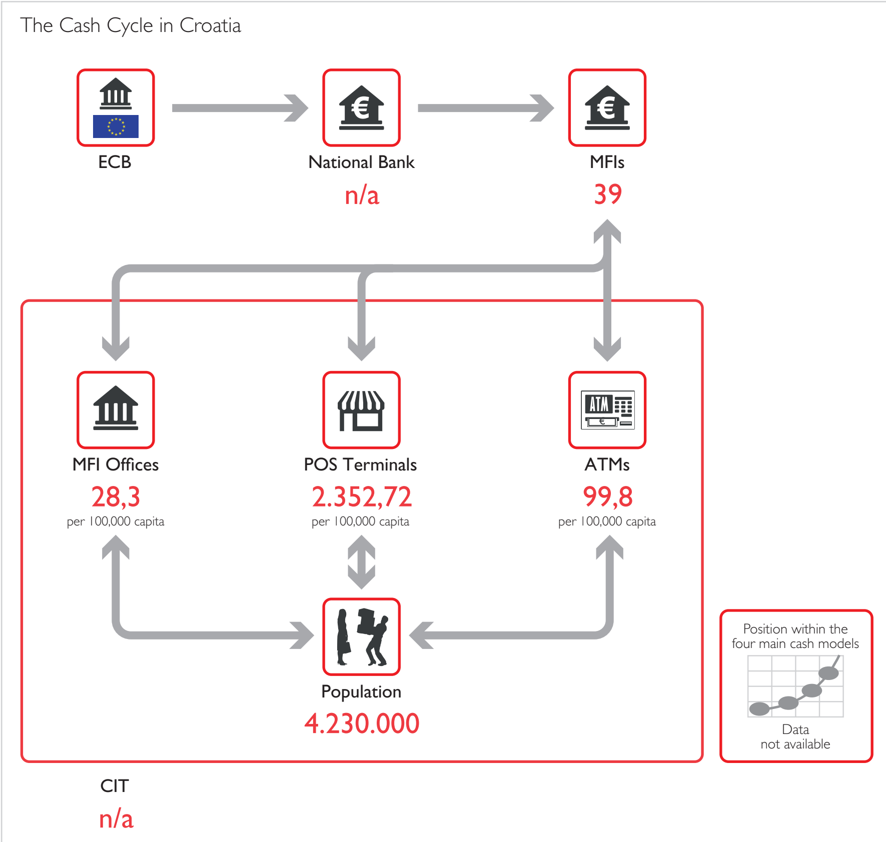
Of a total number of ATMs in the country banks own 82.27%, while banks own 54,67% of all POS terminals in the country, with the remainder being owned by other legal entities.

The Cash Cycle

As at 31 December 2014, currency outside banks (currency in circulation) amounted to HRK 18.5bn, which is an increase of 6.3% from the end of 2013.

The Croatian National Bank (CNB) performs the standard functions in the cash cycle and uses the CNB Vault and Cash Centres (CCs) to perform these functions: issuing of notes and coins, withdrawal and processing of worn-out banknotes and bank note authentication (counterfeit checking).

In 2014, the CNB vault received 38.4 million banknotes from CCs that they had sorted as unfit. Since 2013, the total number of unfit banknotes sorted and received dropped by 5.4m, as a result of the application of more lenient parameters for the sorting of banknotes according to quality to extend their use in circulation.



Sources
» Croatian National Bank Annual report 2014

Cyprus

Macro economic figures	
Population	850.000
GDP	17,51 Bio Euro
GDP per capita	€ 20.600 Euro
Income level OECD index	High Income (non OECD)
Currency in circulation outside MFIs	2.022 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	77,35%		8
Cash transaction volume	345 Mio		25
ATMs	470	-4,98%	
	55,3 per 100.000 capita		16
	50,8 per 1.000 km^2		20
POS terminals	22.900	-1,46%	
	2.694,12 per 100.000 capita		5
	2.475 per 1.000 km^2		10
Cards issued per capita	1,30	-2,42%	17
ATM withdrawals - value	€ 3.152,94 per capita		9
ATM withdrawals - number	20,8 per capita	+6,11%	18
MFIs offering payment services	71	-9,36%	18
Offices of MFIs offering payment services	905	-3,92%	
	106,5 per 100.000 capita		3
NCB Branches	1		13
% Population with at least 1 bank account	85,20%		18
Internet penetration	65,46%		22

Cypriots use cash 77% of the time for their payment transactions, yet they also have a widely available electronic payment infrastructure. Cyprus scores high on POSs per km^2 (rank 5) and slightly below EU average on Cards issued per capita (rank 17). However, card payments only amount to about 9% of all transactions in Cyprus.

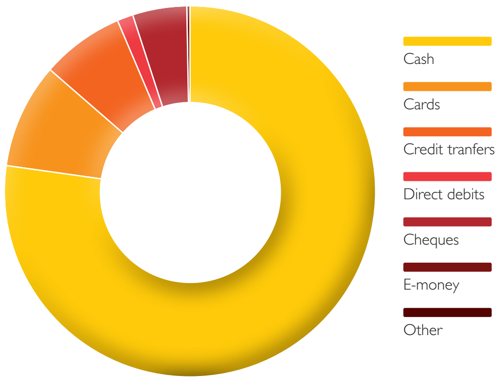
Cash and other Payment Instruments

The payment instrument mix in Cyprus consists for 77% of cash. Cards takes 9,1% while credit transfers take a relatively small share of 'only' 6,4%.

Growth period 2009-2014

Most main indicators show a downward trend, such as the number of ATMs (-4,98%), Offices of

Payment Instrument Mix



MFIs (-3,92%), POSs (-1,46%) and Cards Issued per capita (-2,42%). On the other hand, the number of ATM withdrawals per capita has increased significantly, with 6,11% per annum since 2009.

The Cash Cycle

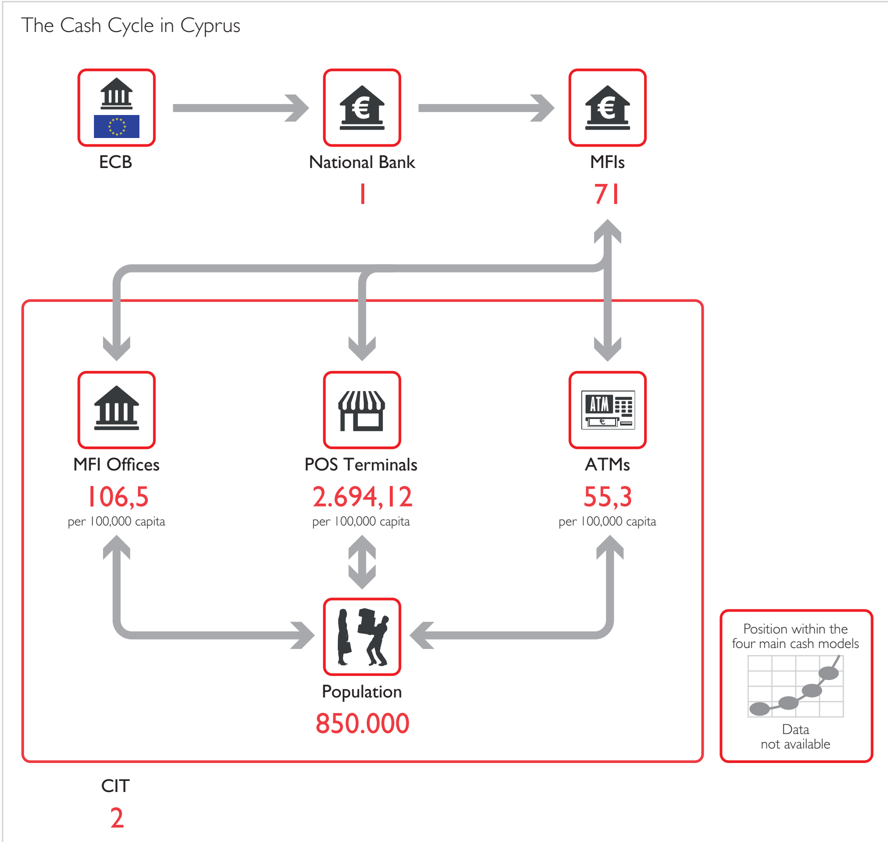
The national bank of Cyprus has a limited role recirculating money to commercial banks and retailers. These tasks are delegated downwards to CITs and CMCs. Their role is sorting and fitness checking. Daily reports to the NCB are made by the CITs and CMCs about the volumes of money passing through after which unfit and counterfeit notes are sent to the NCB for destruction.

Country specific regulations

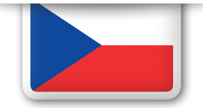
All exchange controls have been shifted in the beginning of 2015 and the market is operating again as per European Union norms.

Latest developments

Euronet, a well known worldwide ATM deployer, has entered the Cyprus market with approximately 80 ATMs island wide. Travelex is expected to enter the Cyprus market with approx 30 ATMs in 2016.



Sources
» National Bank of Cyprus – Annual Report 2014



Czech Republic

Macro economic figures	
Population	10.520.000
GDP	154,74 Bio Euro
GDP per capita	€ 14.709 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	14.782,70 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	76,89%		9
Cash transaction volume	3.527 Mio		10
ATMs	4.440	+4,06%	
	42,2 per 100.000 capita		26
	56,3 per 1.000 km^2		16
POS terminals	101.080	+4,99%	
	960,84 per 100.000 capita		25
	1.282 per 1.000 km^2		16
Cards issued per capita	1,04	+2,86%	23
ATM withdrawals - value	€ 2.389,73 per capita		21
ATM withdrawals - number	17,5 per capita	+1,70%	22
MFIs offering payment services	67	+2,59%	19
Offices of MFIs offering payment services	5.712	+0,90%	
	54,3 per 100.000 capita		14
NCB Branches	n/a		n/a
% Population with at least 1 bank account	80,70%		20
Internet penetration	74,11%		15

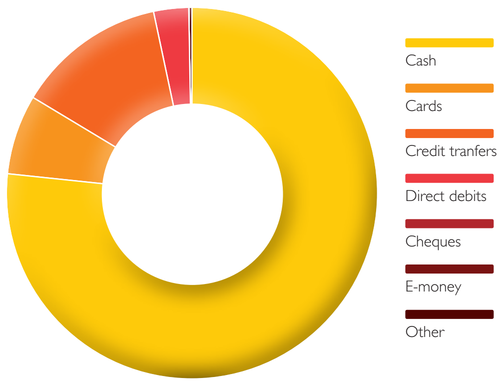
The Czech Republic is clearly developing its payments infrastructure. Even when the absolute numbers for key metrics per capita, such as ATMs, Cards issued, POS terminals, are still below EU average, the growth rates are among the highest in the EU. With just over 75% cash payments are dominating the payment mix in the Czech Republic.

Cash constitutes 77% of all payments transaction in the Czech Republic, followed by Credit Transfers and Card payments.

Development 2009-2014

Even though access to cash is still relatively limited, this has improved significantly over the past years. The numbers of ATMs (+24,4%) and

Payment Instrument Mix



MFI offices (+5,4%) have both increased over the past 6 years.

The electronic payment infrastructure has also been improved. The number of cards issued in the country has increased (with 2.9% per annum to 10,98 million) as well as the number of POS terminal (+ 29,9% to a total of 101.080). ATM withdrawals have increased to a total of 184,2 million (+10,5% since 2009).

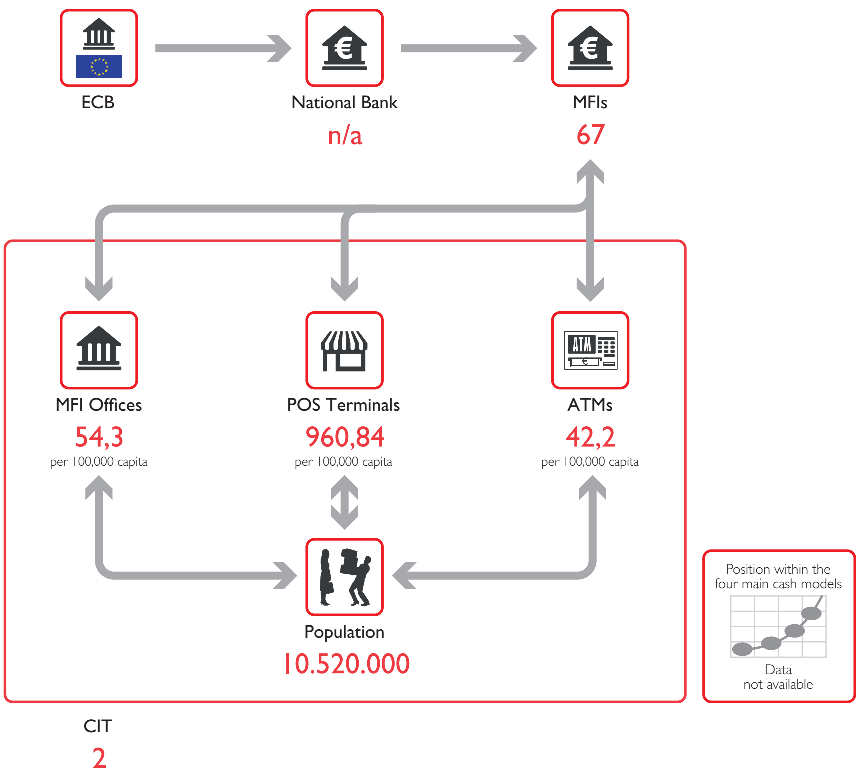
The Cash Cycle

The value of currency in circulation was CZK 469.5 billion on 31 December 2014, up by CZK 27.7 billion on a year earlier. Cash turnover at the CNB's branches amounted to CZK 1,397.3 billion, up by 0.4% year on year. The CNB's cash offices received 720.8 million banknotes and 394.2 million coins from circulation and issued 733.0 million banknotes and 458.2 million coins. The CNB's branches processed 726.7 million banknotes and 381.6 million coins (compared to 720.0 million banknotes and 395.6 million coins in 2013). The CNB removed 12.7% of the total number of processed banknotes as unfit for further circulation.

Country specific regulations

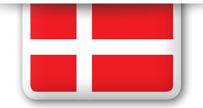
There are no restrictions on cash usage in the Czech Republic. Each bank has different limit for depositing and inserting money in bank branch, it depends on the credibility of the bank client.

The Cash Cycle in Czech Republic



Sources

» Czech National Bank – Annual Report 2014



Denmark

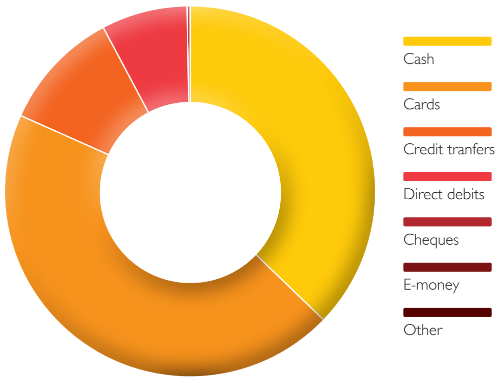
Macro economic figures	
Population	5.640.000
GDP	257,75 Bio Euro
GDP per capita	€ 45.700 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	7.476,04 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	37,39%		24
Cash transaction volume	1.055 Mio		21
ATMs	2.530	-2,37%	
	44,9 per 100.000 capita		23
	59,0 per 1.000 km^2		15
POS terminals	139.240	+5,65%	
	2.468,79 per 100.000 capita		9
	3.245 per 1.000 km^2		7
Cards issued per capita	1,58	+2,88%	11
ATM withdrawals - value	n/a		n/a
ATM withdrawals - number	n/a	n/a	n/a
MFIs offering payment services	123	-4,24%	16
Offices of MFIs offering payment services	1.106	-7,52%	
	19,6 per 100.000 capita		24
NCB Branches	n/a		n/a
% Population with at least 1 bank account	99,70%		2
Internet penetration	94,63%		2

Denmark relies heavily on its well-developed electronic payment infrastructure, with (only) 37% of all transactions conducted in Cash. The government has taken an active role in reducing the importance of cash as a payment instrument, and furthering the transition to an electronic payment culture. During 2015 the legal status of cash was debated but not altered by the Danish government. Denmark scores highest in bank penetration, with 99.7% of the people above the age of 15 having a bank account.

Denmark is one of 3 countries where cash does not represent the largest share in the total payment volume. Cards take 44% and cash comes second with 37%.

Payment Instrument Mix



Growth period 2009-2014

Access to cash is restricted as the number of ATMs and the number of MFI offices offering payment services is declining: -14,2% to 2.530 and -45,1% to 1.106 respectively. At the same time Cards Issued (+19,8% to 8,9 million) and especially the number of POSs (+33,9% to 139.240) increased even further.

The Cash Cycle

In Denmark recirculation of cash happens in smaller cycles and does not necessarily involve the Danish National Bank. Private CIT companies have a hard time in Denmark as most cash logistics are handled by BKS, a CIT jointly owned by the larger commercial banks. Commercial banks also own, or work with, CMCs qualified to recirculate cash.

Country specific regulations

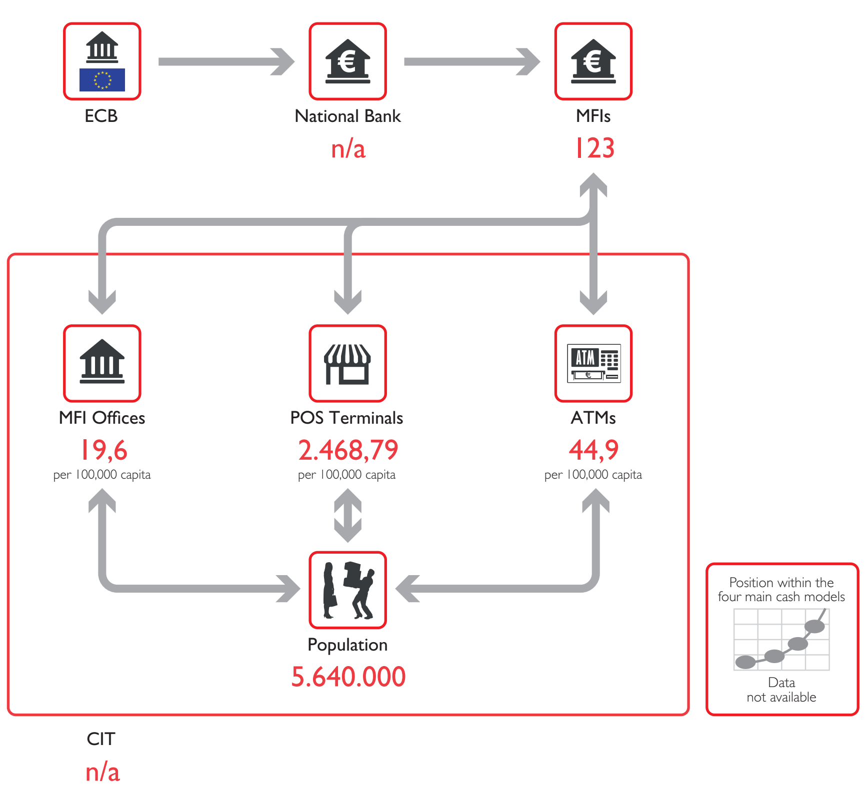
Denmark is in the process of preparing legislation, which, if adopted, would make retailers and buyers jointly responsible for the taxes that need to be paid over the transaction amount. This will be for amounts of 10.000 DKK (€1.340,-) and upwards.

Latest developments

A proposal to allow Danish retailers the freedom to deny cash as a legal tender in their shops was not adopted by the Danish government in 2015, yet this is a clear signal that the debate on the status of Cash is very much alive in Denmark. Exemplary to this discussion, ATMIA reports that the Danish National Bank is printing vast quantities of banknotes, intended to be put into circulation gradually until 2030, and that the DNB does not expect to ever print any more, which would suggest a further push towards a Cashless society. Formally the DNB states: "All banknotes issued after 1945 are still legal tender and can be exchanged for new banknotes."

In 2014 Denmark's version of Instant Payments went live: Straksclearing, which makes it possible for citizens to transfer amounts of up to kr. 500,000 from their own account to an account in another bank within seconds 24/7/365.

The Cash Cycle in Denmark



Sources

» https://www.nationalbanken.dk/en/banknotes_and_coins/Pages/default.aspx

» National Bank Denmark – Annual Report 2014

Estonia

Macro economic figures	
Population	1.320.000
GDP	19,96 Bio Euro
GDP per capita	€ 15.121 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	2.577 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	44,16%		21
Cash transaction volume	264 Mio		26
ATMs	720	-3,62%	
	54,5 per 100.000 capita		17
	15,9 per 1.000 km^2		26
POS terminals	28.760	+1,33%	
	2.178,79 per 100.000 capita		12
	636 per 1.000 km^2		22
Cards issued per capita	1,37	+0,07%	15
ATM withdrawals - value	€ 2.810,61 per capita		13
ATM withdrawals - number	29,4 per capita	-2,60%	5
MFIs offering payment services	47	+3,95%	22
Offices of MFIs offering payment services	164	-11,85%	
	12,4 per 100.000 capita		27
NCB Branches	1		13
% Population with at least 1 bank account	96,80%		10
Internet penetration	80,00%		11

Cash remains important in Estonia as a means of payment. Even though Estonia has a relatively small electronic payment infrastructure compared to the rest of Europe (it ranks 13/22 in POS coverage) it has relatively high electronic payments in ratio to its cash payments (55,9% vs 44,1%).

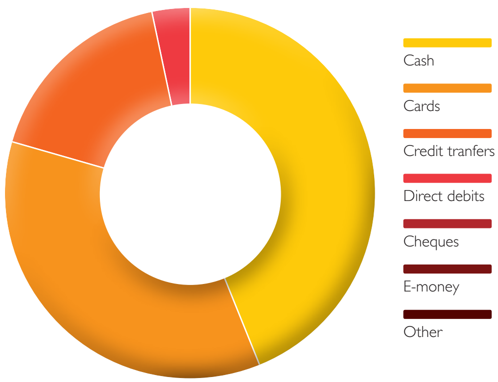
Cash and other Payment Instruments

Cash is still the most used payment instrument in Estonia, yet cards also account for a large share of total payment volumes.

Development 2009-2014

The number of ATMs in Estonia decreased by 21,7% to 720 (2014), as did the number of ATM withdrawals (-16,9% to 38,9 mio). An even stronger decrease is observed for the number of

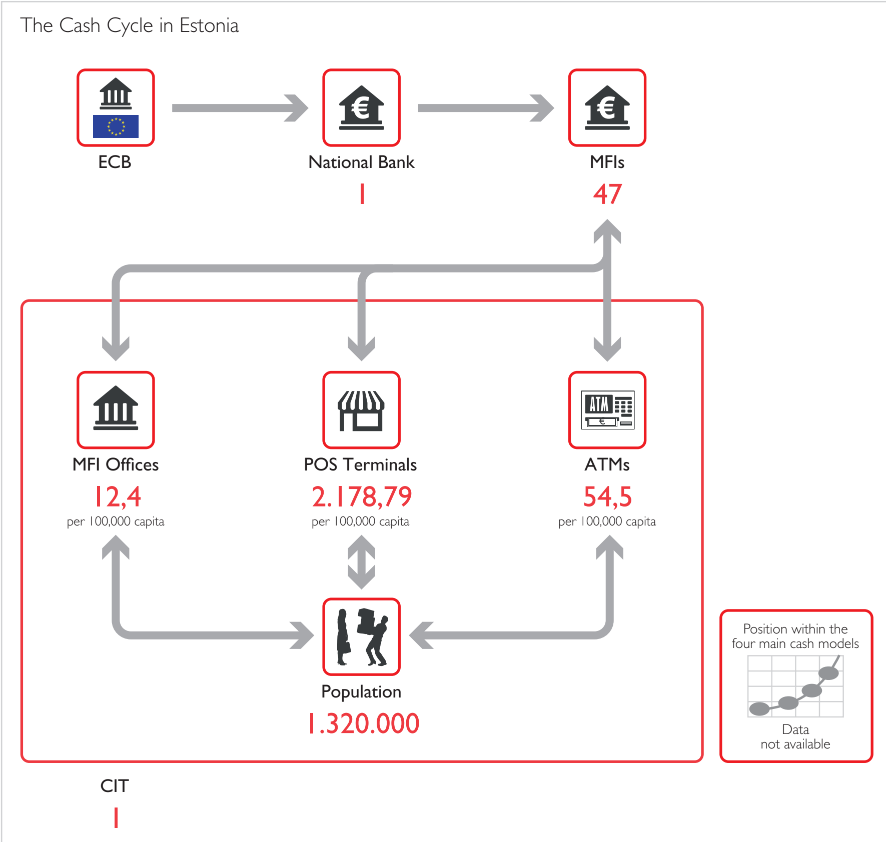
Payment Instrument Mix



offices of MFIs offering payment services in the country, decreasing by 71,1% to a total of 12,4 per 100.000 inhabitants. Cards issued remained largely the same at an average level of 1.37 cards per inhabitant, while the POS availability went up by 8,0% to a total of 28.760.

The Cash Cycle

As the central bank of a euro-area country, Eesti Pank is responsible for satisfying the demand for Euro banknotes and coins in Estonia and for managing and maintaining the security of the cash resources needed for circulation. Eesti Pank's role in organising cash circulation gives it responsibility for ensuring that notes and coins are handled to the common standard of the Euro area and that requirements for recirculation and authenticity control are met.



Sources
» Estonian National Bank – Annual Report 2014

Finland

Macro economic figures	
Population	5.460.000
GDP	205,18 Bio Euro
GDP per capita	€ 37.579 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	16.793 Mio Euro
Currency	Euro

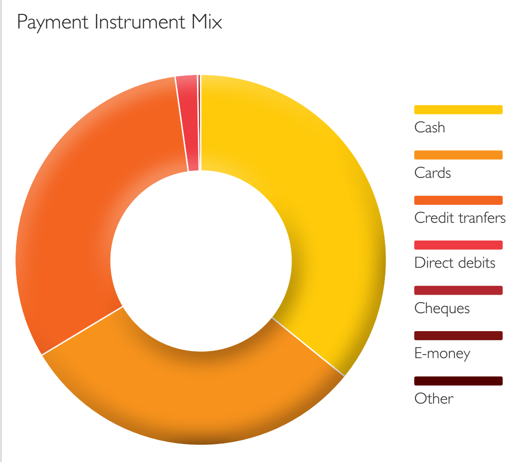
Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	36,06%		26
Cash transaction volume	1.369 Mio		19
ATMs	2.210	-4,10%	
	40,5 per 100.000 capita		27
	6,5 per 1.000 km^2		28
POS terminals	156.900	-4,07%	
	2.873,63 per 100.000 capita		4
	464 per 1.000 km^2		26
Cards issued per capita	1,64	+3,99%	9
ATM withdrawals - value	€ 2.639,19 per capita		16
ATM withdrawals - number	26,6 per capita	-3,64%	11
MFIs offering payment services	282	-3,24%	9
Offices of MFIs offering payment services	1.276	-3,56%	
	23,4 per 100.000 capita		22
NCB Branches	2		12
% Population with at least 1 bank account	99,70%		1
Internet penetration	91,51%		5

Finland has a highly developed electronic payment infrastructure. Cash only represents 36% of all payment transactions, which is among the lowest percentages in the EU28. ATMs and the number of MFI offices offering payment services have been declining rapidly, while POSs per capita, Internet and banking penetration is very high in Finland.

The Central Bank has delegated most of the cash handling in the commercial sector. The three largest commercial banks own a joint venture (Automatia). This organization owns 95% of Finland's ATM's.

Cash and other Payment Instruments

Even though electronic payments account for more than half of all payment transactions, cash is still the largest payments instrument in terms



of transaction volume. Together with Cards (3%) and Credit Transfers (31%), Cash covers 98% of all payment transactions in Finland.

Developments 2009-2014

Access to cash has been declining rapidly in Finland. ATMs have decreased with 24.6% to a total of 2.210 ATMs in Finland. The number of MFI offices has also decreased (by 21.3% to 23.4 per 100.000 inhabitants), which is among the lowest availability in the EU28. This is in sharp contrast to the availability of POS terminals, which (at 2.874 per 100.000 inhabitants) ranks among the highest in the EU. The number of ATM withdrawals has decreased by 20.01%. The number of cards issued in the country increased by close to 27% to 1,6 cards per inhabitant.

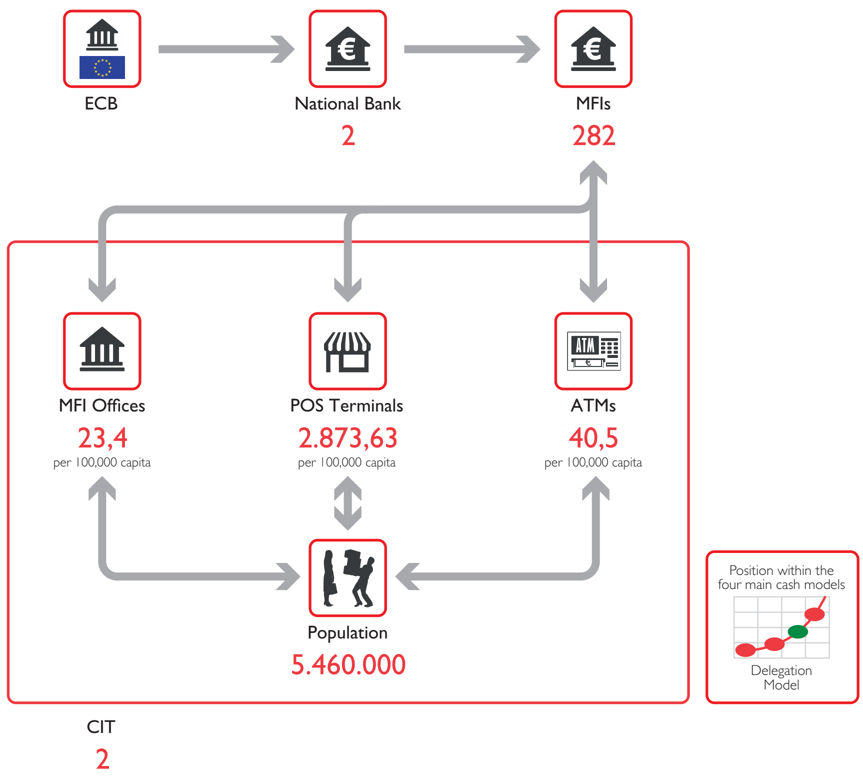
The Cash Cycle

The National Bank of Finland's involvement in the cash cycle is very limited. The bank of Finland acts as a regulatory authority and as a wholesale provider of cash. The three largest commercial banks own a joint venture called Automatia. This organization owns 95% of Finland's ATM's. CITs/CMCs (Loomis and G4S) operate the ATM´s from cash centers with money that is owned by Automatia.

Country specific regulations

Finnish retailers are allowed to deny cash payments if properly stated before the sale is made. Pertaining to ATM regulations, most cash withdrawals are free in Finland. There are some small banks that charge a small percentage when withdrawing money from an ATM owned by a different bank.

The Cash Cycle in Finland

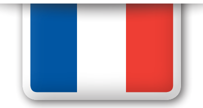


Latest developments

Retail company S-group owns a subsidiary called Rekla that does Cash Management for part of S-group stores, restaurants and hotels in cash centers. Rekla operates directly with the NCB and detects and recycles unfit money. Rekla purchases CIT services from licensed CIT companies.

Sources

» The role of the central bank in the Cash-Cycle, Bank of Finland, 2010.
» National Bank of Finland – Annual Report 2014



France

Macro economic figures	
Population	66.170.000
GDP	2.132,45 Bio Euro
GDP per capita	€ 32.227 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	81.199 Mio Euro
Currency	Euro

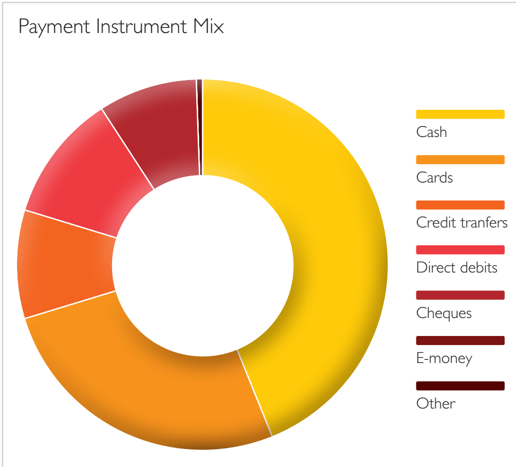
Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	44,15%		22
Cash transaction volume	14.283 Mio		5
ATMs	114.870	+18,19%	
	173,6 per 100.000 capita		1
	181,5 per 1.000 km²		6
POS terminals	1.607.050	+2,58%	
	2.428,67 per 100.000 capita		10
	2.539 per 1.000 km²		9
Cards issued per capita	1,22	-1,54%	18
ATM withdrawals - value	€ 2.034,91 per capita		24
ATM withdrawals - number	24,3 per capita	-0,84%	14
MFIs offering payment services	503	-4,93%	5
Offices of MFIs offering payment services	37.621	-0,31%	
	56,9 per 100.000 capita		13
NCB Branches	73		1
% Population with at least 1 bank account	97,00%		9
Internet penetration	81,92%		9

In France only 44% of all transactions are performed with cash, yet cash does remain the largest payment instrument. Cards take about 25% of the volume and the rest is almost evenly distributed across Credit Transfers, Direct Debits and cheques. Cheques still account for a large share of France's payment volumes, especially compared to other EU countries.

France has the highest number of National Bank Branches (73), yet a programme (Banque2020) is in place to reduce this number significantly and increase efficiency in the cash cycle in the coming years.

Cash and other Payment Instruments

Even though in France cash is still the main payment instrument, electronic means have overtak-



en the cash sector when combined. France still relies relatively heavily on cheques.

Development 2009-2014

The number of offices of MFIs offering payment services continued its downward trend (-0,31%) to 56,9 per 100.000 capita. While the number of POSs increased, the number of cards issued in the country decreased to just 1,2 cards per inhabitant, ranking France at nr 18. The number of ATM withdrawals remained stable at 1.6 billion per annum.

The Cash Cycle

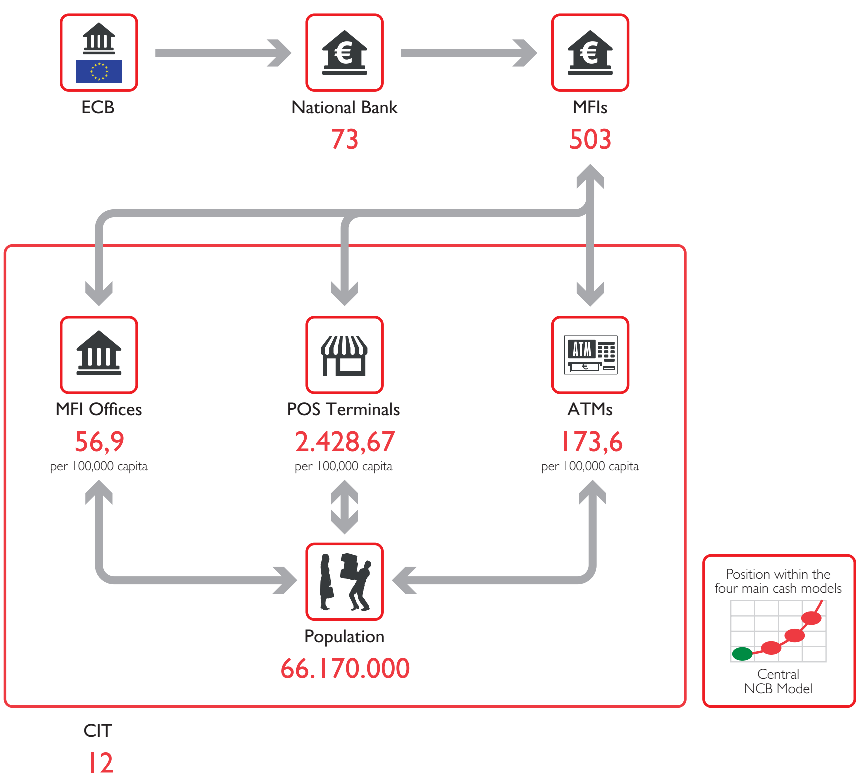
In France the National bank plays a pivotal role in the cash cycle. They remain the only one in control of wholesale cash services and are the only authority allowed to recirculate cash into the system. With a total of 73 NCB branches they aimed to provide cash wholesale locations (redistribution points) never further away than 80 km from any CIT or Commercial bank. All the sorting and fitness checking is ultimately done by the Banque de France.

However, recently, the NCB has decided to start delegating these task downwards, creating smaller cycles within the bigger cash cycle. They are planning on realising a recirculation point on multiple levels of the cash cycle; banks, CIT and retail.

Country specific regulations

Currently the cash payment limit is set at €3000,- for fiscal residents and €15.000 for non-residents acting as consumer, with ongoing effort to further reduce these limits. At government offices cash payment are restricted to €300,-.

The Cash Cycle in France



Latest developments

In France there are 12 CIT companies active; one of which acquired the status of Payment Institution in 2014, using the possibility provided by the adopted Payment Services Directive.
France was included in the Cross-Country Comparison study with Payment Diary Survey Data (2014). According to this study cash accounted for 56% of consumer transaction volume in terms of volume and 15% in terms of value.

Sources

» The Leadership of the Central Bank in the Cash Cycle, Banque de France; Caisse generale, 2004.
» Banque de France 2020: a roadmap for cash stakeholders, Banque de France, 2013
» Banque de France – Annual Report 2014
» John Bagnall, David Bounie, Kim Huynh, Anneke Kosse, Tobias Schmidt, Scott Schuh and Helmut Stix, "Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data", 2014

Germany

Macro economic figures	
Population	82.360.000
GDP	2.915,65 Bio Euro
GDP per capita	€ 35.401 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	240.518 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	60,79%		16
Cash transaction volume	28.233 Mio		1
ATMs	85.420	+1,27%	
	103,7 per 100.000 capita		5
	239,2 per 1.000 km^2		4
POS terminals	881.180	+6,09%	
	1.069,91 per 100.000 capita		21
	2.467 per 1.000 km^2		11
Cards issued per capita	1,63	+0,93%	10
ATM withdrawals - value	€ 4.157,60 per capita		3
ATM withdrawals - number	32,3 per capita	+4,85%	3
MFIs offering payment services	1.857	-0,71%	1
Offices of MFIs offering payment services	37.131	-1,52%	16
	45,1 per 100.000 capita		
NCB Branches	41		2
% Population with at least 1 bank account	98,10%		5
Internet penetration	83,96%		7

With 56 CIT companies active in the country, Germany is a fragmented market when it comes to cash logistics. The high number of National Central Bank (NCB) branches further illustrates this. Cash is the most used payment means at 59%. Germany scores relatively high on ATMs and relatively low on POSs per capita, yet the number of POSs is increasing significantly over the past years.

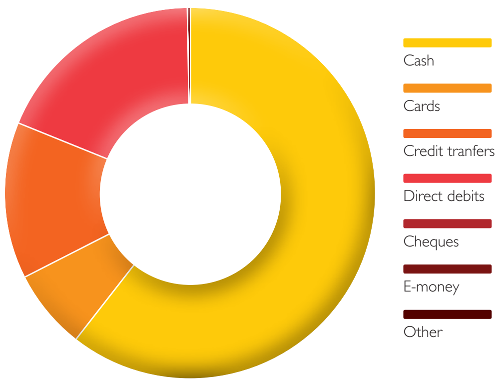
Cash and other Payment Instruments

As stated, Cash is by far the biggest payment instrument, while the share of Cards payments is remarkably low. This may be due to the limited availability of POSs in Germany.

Developments 2009-2014

The number of ATMs increased to 85.420

Payment Instrument Mix



(+7,6%) while the number of MFI offices decreased to 45,1 per 100.000 inhabitants. The number of POSs increased significantly to 881.180 (+36,53%), yet still remains well below the EU average for POSs per capita.

The Cash Cycle

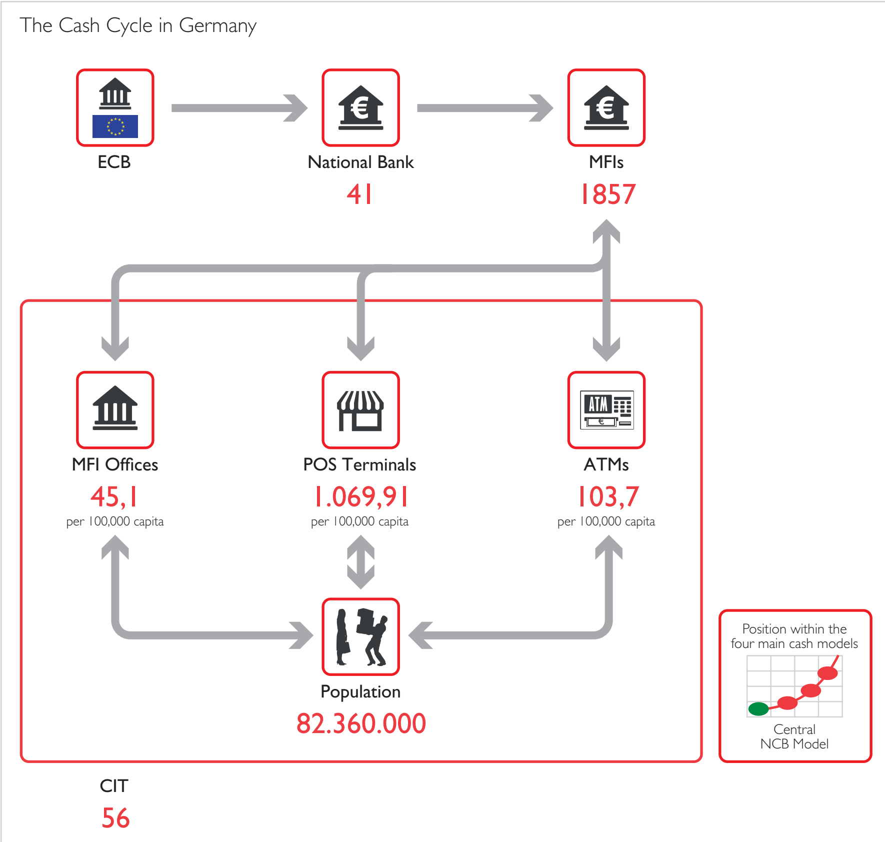
The cash logistics market is very fragmented with 56 CIT companies active in the market (2012). The Bundesbank is directly involved in the process, as since 1994 it is law that no banknote may come out of an ATM machine that has not been checked by the Bundesbank[1]. However, NCB involvement in cash logistics is diminishing. The NCB works together with CIT's and CMC's in order to restrict their own responsibilities. Only the sorting and note fitness checking are ultimately done by the NCB.

Country specific regulations

Fees for ATM withdrawals are charged for guest usage, with fees ranging from €1,95 up to €5,-.

Latest developments

Germany was included in the Cross-Country Comparison study with Payment Diary Survey Data (2014). According to this study cash accounted for 82% of consumer transaction volume in terms of volume and 53% in terms of value.



Sources

» The Banknote cycle and banknote recycling in Germany, Deutsche Bundesbank, 2011.
» John Bagnall, David Bounie, Kim Huynh, Anneke Kosse, Tobias Schmidt, Scott Schuh and Helmut Stix, "Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data", 2014.

1 The Banknote cycle and banknote recycling in Germany, Deustche Bundesbank, 2011.

Greece

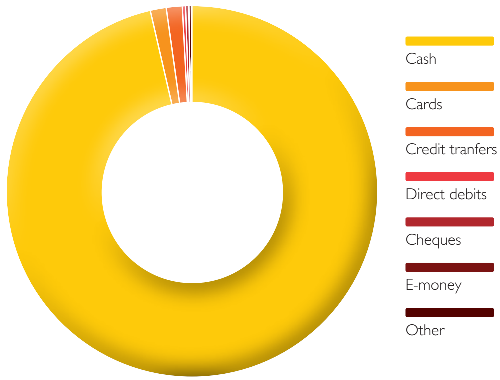
Macro economic figures	
Population	10.990.000
GDP	179,08 Bio Euro
GDP per capita	€ 16.295 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	27.172 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	96,61%		1
Cash transaction volume	5.584 Mio		7
ATMs	6.980	-3,99%	
	63,5 per 100.000 capita		13
	52,9 per 1.000 km^2		18
POS terminals	130.440	-11,57%	
	1.186,90 per 100.000 capita		20
	989 per 1.000 km^2		19
Cards issued per capita	1,18	-2,27%	21
ATM withdrawals - value	€ 3.836,21 per capita		5
ATM withdrawals - number	18,0 per capita	+0,44%	21
MFIs offering payment services	53	-3,48%	20
Offices of MFIs offering payment services	2.721	-6,39%	
	24,8 per 100.000 capita		21
NCB Branches	17		4
% Population with at least 1 bank account	77,90%		22
Internet penetration	59,87%		25

Please note: Data used in this report is based on the most recent, publically available statistics from the ECB (2009 – 2014). Given the dynamics in Greece's financial and political situation, it is difficult to be fully up to date and to draw conclusions based on this data, as the situation is changing almost on a day to day basis, at the time of writing this report.

Greece has the highest percentage of cash usage in all of the EU: 97%. Most key indicators in Greece's payment landscape show negative growth numbers. These include the number of ATMs, POS terminals, Cards Issued and offices of MFIOs offering payment services. Conversely, the number of ATM withdrawals per

Payment Instrument Mix



capita increased. Greece scores low in Internet penetration and has a relatively high unbanked population.

Cash and other Payment Instruments

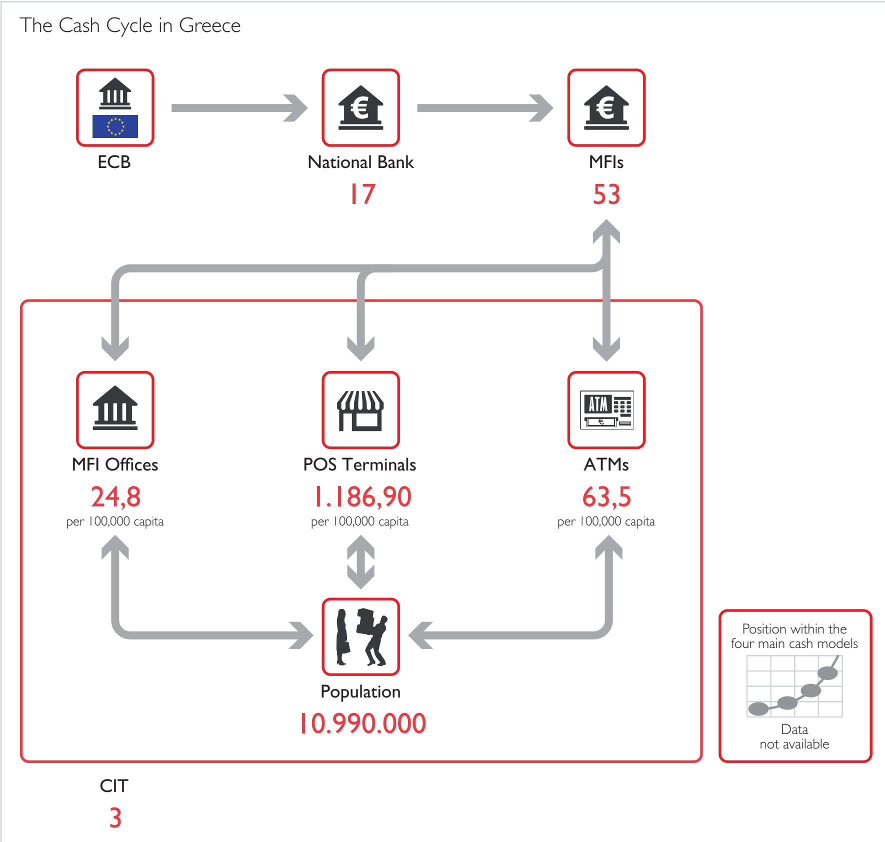
As stated, Cash usage in Greece is the highest of all EU countries, taking 97%.
Cards amount to only around 1,5 % of all transactions, as do credit transfers.

Developments 2009-2014

The number of ATMs decreased by 24,0%, most likely related to the reduction in MFI offices in the country: - 38,3%. POS accessibility has decreased by 69,4% going down to 130.440. Also cards issued within the country decreased: -15,1% (to 12.953). The number of ATM withdrawals remained largely stable at 197,8 million, while the average amount per ATM withdrawal decreased to EUR 213,11 which still is the highest number across the EU28.

The Cash Cycle

The Bank of Greece takes all necessary measures to ensure a high quality of banknotes in circulation and to duly analyze counterfeits. All euro banknotes and coins that are returned to the Bank of Greece are subject to authentication and fitness checks with the use of fully automated machines. Worn or defective euro banknotes are withdrawn from circulation and replaced by new or fit banknotes. In order to ensure the smooth operation of the cash life cycle and the good quality of banknotes in circulation, the Bank of Greece monitors the condition of euro banknotes in circulation within its territory.



Country specific regulations

In Greece cash payments may officially not exceed a value of €1.500,-.

Sources
» National Bank of Greece – Annual Report

Hungary

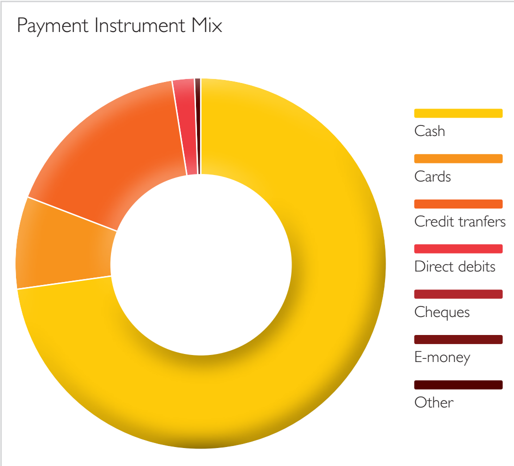
Macro economic figures	
Population	9.870.000
GDP	104,24 Bio Euro
GDP per capita	€ 10.561 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	10.102,88 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	72,79%		12
Cash transaction volume	2.402 Mio		15
ATMs	4.880	+0,46%	
	49,4 per 100.000 capita		21
	52,5 per 1.000 km^2		19
POS terminals	104.900	+7,97%	
	1.062,82 per 100.000 capita		22
	1.128 per 1.000 km^2		18
Cards issued per capita	0,90	+0,53%	27
ATM withdrawals - value	€ 2.127,66 per capita		23
ATM withdrawals - number	11,4 per capita	-1,04%	26
MFIs offering payment services	168	-2,16%	14
Offices of MFIs offering payment services	6.335	-2,21%	10
	64,2 per 100.000 capita		
NCB Branches	n/a		n/a
% Population with at least 1 bank account	72,70%		24
Internet penetration	72,84%		16

Cash also dominates the payment mix in Hungary (73%), and this may partly be explained by the limited availability of essential parts of the electronic payment infrastructure: POSs and Cards Issued. Even though these score high in terms of growth rates, the absolute numbers per capita are still well below the EU average.

Cash and other Payment Instruments

Hungary is a real cash country. It has relatively low Internet penetration and similarly low percentages of adults with a bank account. With cards representing only 8%, this cash alternative seems under-represented when compared to EU averages. Credit Transfers account for 17% of all payment transactions.



Developments 2009-2014

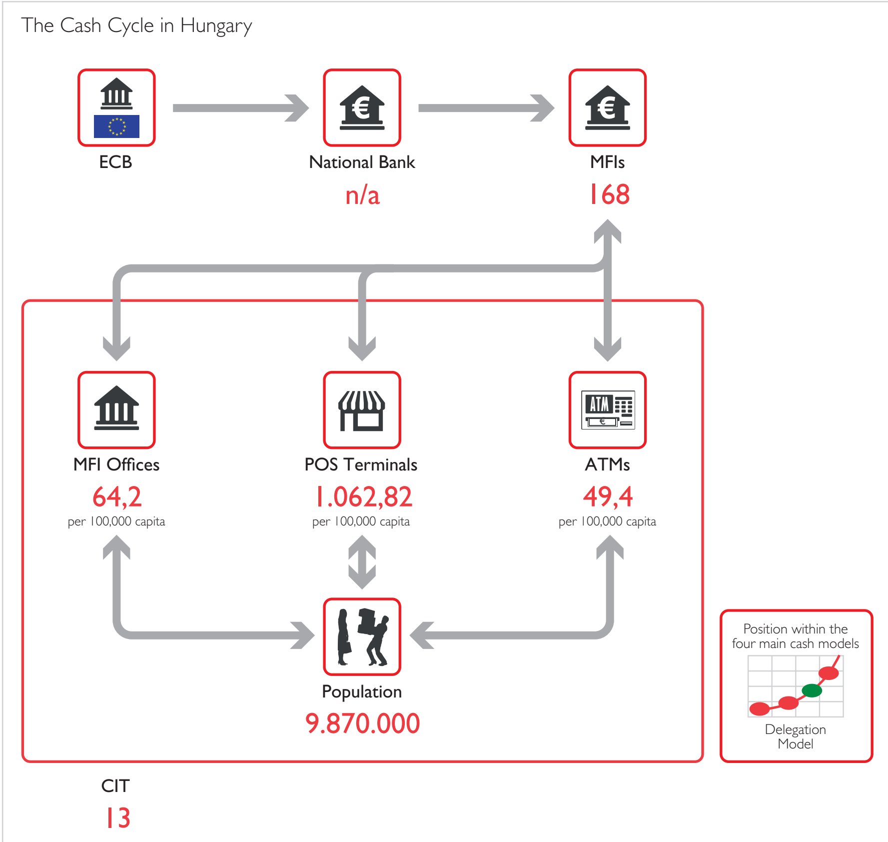
The most significant development in Hungary in 2009-2014 is the increase in the number of POS terminals, which grew by 47,8% over the period to 104.900. Cards issued per capita also increased, yet with 0,9 cards per inhabitant Hungary ranks 27th in the EU28. The number of ATMs in the country increased slightly (2,7%) yet the number of MFI offices dropped by 13.3% to 6.335 in total and 64 offices per 100.000 inhabitants. ATM Withdrawals decreased by 7,7% in this period to 112,8 million in 2014.

The Cash Cycle

The Hungarian cash cycle is a system of shared responsibility. Both the Central bank and (13) CIT companies handle the fitness sorting, authentication and recirculation of notes and coins in Hungary.

Country specific regulations

Under the Act No. LXXXV of 2009 Section 36/A on the Pursuit of the Business of Payment Services (hereinafter: Act), private clients are entitled to make the first two cash withdrawals in a calendar month – with a total amount not exceeding HUF 150,000 (equal to EUR 480) – free of charge from 1 February 2014. According to the Act, if the total amount of first two cash withdrawals in the month exceeds HUF 150,000 bank has right to charge fee for the amount in excess of HUF.



Latest developments

Hungary introduced the compulsory e-cash machines, which are connected to the National Tax Office. Last year the cash outflow and quantity increased in the circle of citizens, caused by the low Central Bank base rate and the additional taxes put on the banking sector in turn leading to an increase in their consumer prices for bank services.

Sources

- Network-based analyses of Hungarian cash supply, Magyar Nemzeti Bank, 2012.
- MND bulletin – march 2010

Ireland

Macro economic figures	
Population	4.610.000
GDP	189,05 Bio Euro
GDP per capita	€ 41.009 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	15.500 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	69,07%		13
Cash transaction volume	1.668 Mio		17
ATMs	2.630	-3,77%	
	57,0 per 100.000 capita		15
	37,7 per 1.000 km²		23
POS terminals	40.760*	-8,18%	
	884,16 per 100.000 capita		26
	584 per 1.000 km²		24
Cards issued per capita	1,34	+1,93%	16
ATM withdrawals - value	€ 3.598,70 per capita		8
ATM withdrawals - number	28,9 per capita	-5,73%	7
MFIs offering payment services	448	-1,73%	6
Offices of MFIs offering payment services	1.870	-4,07%	
	40,6 per 100.000 capita		17
NCB Branches	1		13
% Population with at least 1 bank account	93,90%		14
Internet penetration	78,25%		12

* The decrease in the number of POSs in Ireland can possibly be explained by the change in reporting on POSs in a country to POSs provided by resident PSP from the country. The number of POSs mentioned here doesn't necessarily reflect the number of POSs in Ireland. In 2013 the number of POSs in Ireland was 154.160.

Over the period of 2009 until 2014 Ireland shows negative growth in most key indicators, except Cards issued. Cash represents 69% of all transactions in Ireland. Initiatives are being deployed to improve the uptake of electronic payment instruments and to improve the (cost) efficiency in cash logistics.

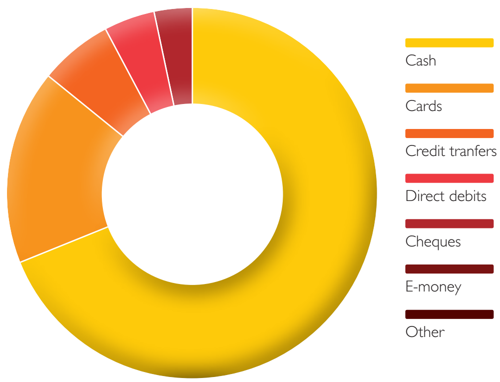
Cash and other Payment Instruments

The payment instrument mix in Ireland consists mainly of cash. The runner up is card payments, which takes a 17% share in the payments market.

Developments 2009-2014

ATMs have decreased in Ireland going down from 3.400 to 2.630 (-22,7%). Offices of MFIs have decreased at the same rate (-24,4%) to 1.870 in the 6-year period. The number of cards

Payment Instrument Mix



issued has increased (+13,3%) to 6,2 million, while the number of Cash withdrawals has decreased significantly (-33,4% to 133,2 million) while the average amount of a cash withdrawal in Ireland is EUR 124,58.

The Cash Cycle

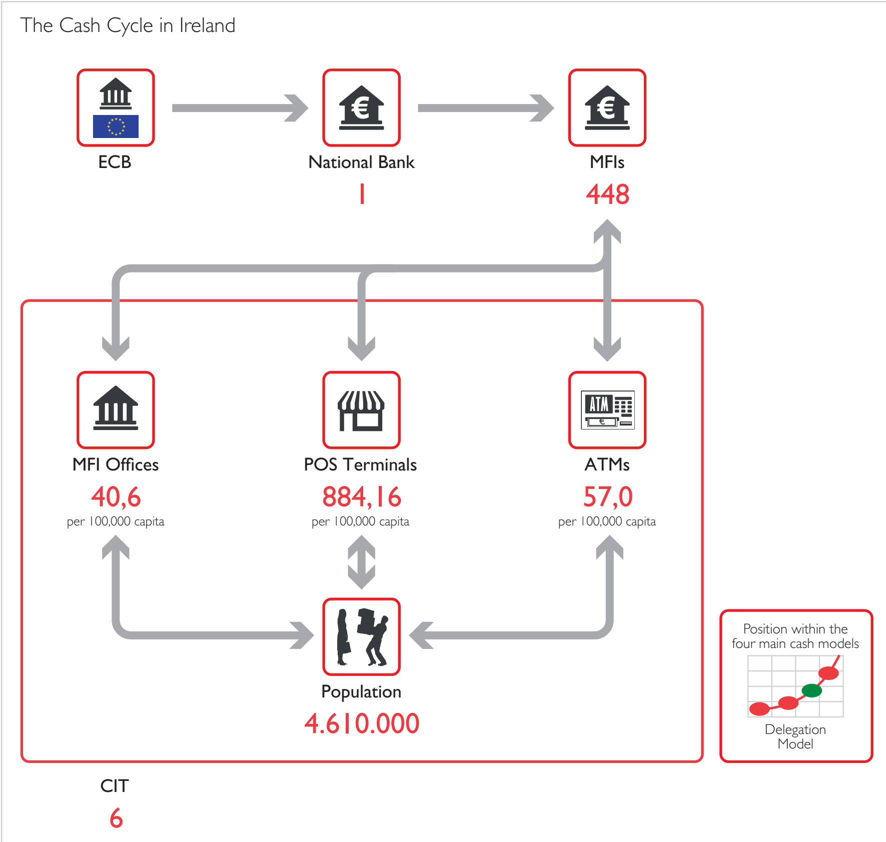
Cash is distributed by the Central Bank, and stored and processed. In Ireland the Central Bank does not have a branch network but instead operates a Notes Held to Order ("NHTO") scheme, first established in the 1970's. A number of cash centers operated by three of the largest commercial banks hold notes on behalf of the NCB. From these CMCs the cash is distributed through post offices and CITs to ATMs, bank branches and retailers. For re-circulation, all notes need to re-enter the CMCs, before being distributed downwards again.

Country specific regulations

No official restrictions on the use of cash but in practice €200,- and €500 notes are rarely accepted by retailers.

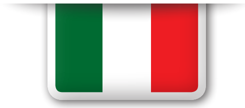
Latest developments

Irish Retail Banks are rapidly expanding the number of self-service and online terminal devices in both branch and offsite locations. A new generation ATMs and Intelligent Deposit Devices are now common across all Banks and counter transactions rapidly reducing in an attempt to reduce cash handling costs. These multifunction terminals allow a comprehensive set of transactions to be undertaken without cashier or customer service interaction.



Sources

- » National Payments Plan: A Strategic Direction for Payments, National Payments Plan Steering Committee, 2013.
- » Bank of Ireland – annual report 2014



Italy

Macro economic figures	
Population	60.800.000
GDP	1.613,86 Bio Euro
GDP per capita	€ 26.544 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	164.527 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	86,27%		4
Cash transaction volume	26.786 Mio		2
ATMs	49.650	-1,44%	
	81,7 per 100.000 capita		11
	164,8 per 1.000 km²		9
POS terminals	1.847.460	+4,44%	
	3.038,59 per 100.000 capita		3
	6.131 per 1.000 km²		5
Cards issued per capita	1,21	+1,15%	19
ATM withdrawals - value	€ 2.949,51 per capita		10
ATM withdrawals - number	15,7 per capita	+12,49%	24
MFIs offering payment services	716	-2,29%	2
Offices of MFIs offering payment services	43.847	-1,52%	
	72,1 per 100.000 capita		5
NCB Branches	33		3
% Population with at least 1 bank account	71,00%		25
Internet penetration	58,46%		26

Italy ranks among the highest (nr 4) cash users in the EU28, with 86% of all transactions completed with cash. Cash is widely available in Italy with ATMs and MFI Offices per capita scoring well above EU average. Alternatives are also available as Italy ranks 3d in POSs per capita, yet the number of cards issued per capita stays behind at 1,2 cards per inhabitant which places Italy at number 22 in the EU28.

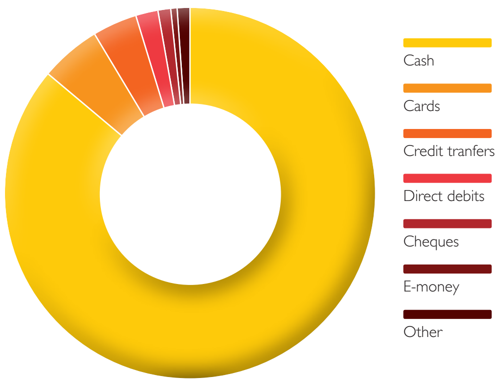
Cash and other Payment Instruments

With Cash taking 86% of the payment mix, the remainder is divided between Cards (5%), Credit Transfers (4%) and Direct Debits (2%).

Development 2009-2014

Even though ATMs are widely available in Italy the total number declined with 1,4% per annum.

Payment Instrument Mix



Conversely, the number of ATM withdrawals increased significantly with 12,8% per annum, totalling 955 million. Despite this impressive growth rate Italy still 'only' ranks 24 in the EU28 for ATM withdrawals per capita. The number of POSs was already relatively high and increased further with 4,4% per annum to a total of 1,8 million in 2014.

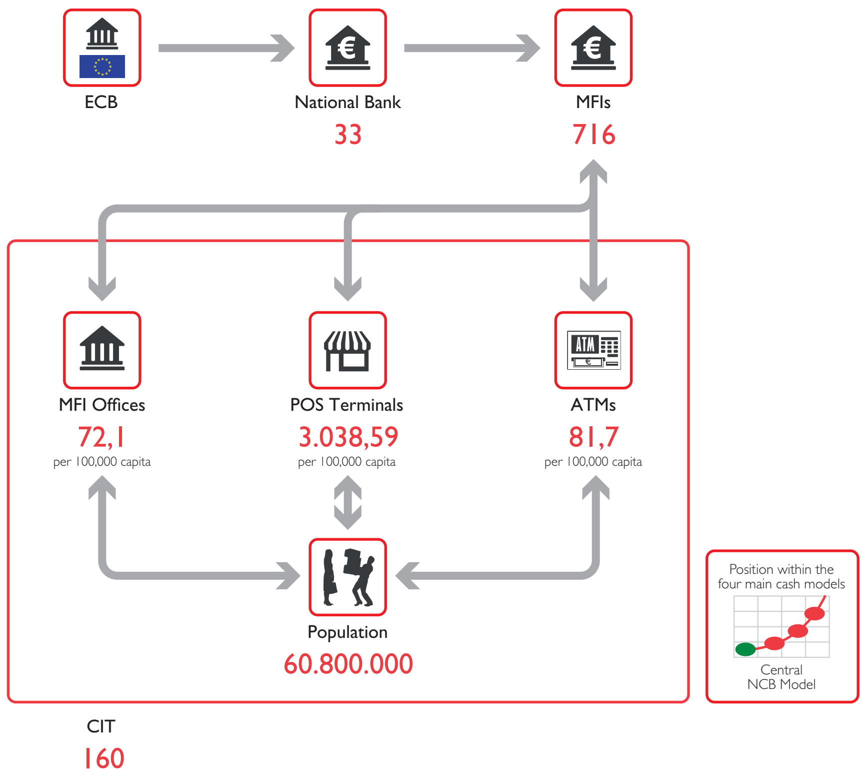
The Cash Cycle

The Italian cash cycle is one of shared responsibilities, as recirculation, including associated fitness and authenticity checking, takes place at multiple levels in the cycle. With 33 branches the Banca d'Italia has a large physical presence in the country, which places Italy at number 3 in the EU28 (for countries that have reported on this statistic). However, CIT companies that are authorized to perform these functions do the majority of recirculation. In total 160 CIT companies are active in Italy (2012), which is the second highest number in this category in the EU28. These companies recirculate 53% of cash in the cycle. Commercial bank branches that certified to recirculate cash perform another 22% of the recirculation and the 33 branches of the NCB handle the rest.

Country specific regulations

There is a cash payments are officially limited to €999,99.

The Cash Cycle in Italy



Sources

» The cash cycle in Italy: structure and recent developments, Banca d'Italia, 2014.

Latvia

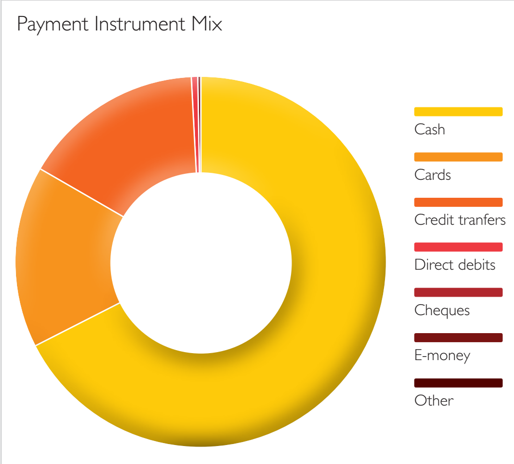
Macro economic figures	
Population	1.990.000
GDP	23,69 Bio Euro
GDP per capita	€ 11.905 Euro
Income level OECD index	High Income (non OECD)
Currency in circulation outside MFIs	668,75 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	67,74%		14
Cash transaction volume	554 Mio		23
ATMs	1.070	-3,16%	
	53,8 per 100.000 capita		18
	16,6 per 1.000 km²		25
POS terminals	28.470	+3,24%	
	1.430,65 per 100.000 capita		17
	441 per 1.000 km²		28
Cards issued per capita	1,17	+0,17%	22
ATM withdrawals - value	€ 2.658,29 per capita		15
ATM withdrawals - number	28,4 per capita	+3,91%	8
MFIs offering payment services	34	0,0%	27
Offices of MFIs offering payment services	941	-3,96%	
	47,3 per 100.000 capita		15
NCB Branches	3		11
% Population with at least 1 bank account	89,70%		16
Internet penetration	75,23%		14

Latvia has been a member of the EU since 2004 but only entered the Eurozone in 2014. Latvia scores relatively low in most categories compared to the EU average. In the opinion of the Bank of Latvia, the dominance of cash in payments is the major obstacle for increasing the efficiency of the payments market. It is considered to be important for the Latvian society to be offered safe, convenient and competitive cash alternatives. One such alternative is payment cards, but other payment instruments may be used as well.

Cash and other Payment Instruments

The payment instrument mix in Latvia consists for 68% of cash. Cards and credit transfer represent another third. Direct Debits are hardly used in Latvia.



Developments 2009-2014

Most notable is restricted access to cash in Latvia. The number of MFI offices as well as the number of ATMs have been decreasing significantly for the last 6 years: -23,7% and -18,9% respectively). At the same time, the number of ATM withdrawals increased by 14,8%. POS availability went up to 28.470 (+ 19,4%), while the number of cards per capita remained largely stable at 1,17.

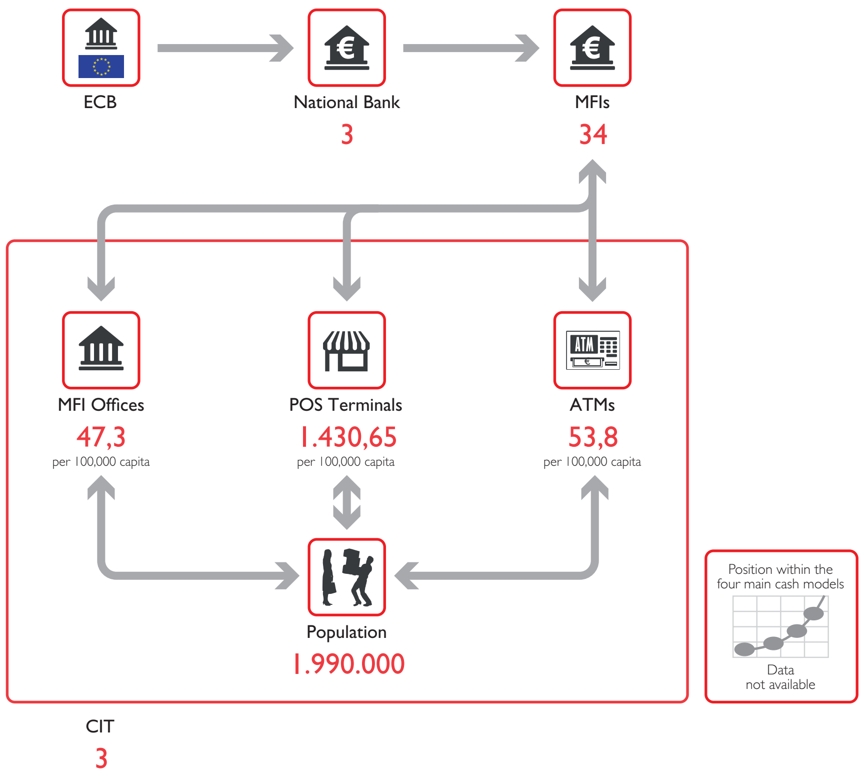
The Cash Cycle

In 2014 Latvijas Banka started to register merchants engaged in processing and recirculating euro banknotes and coins and to monitor their operation. A merchant is entitled to carry out the processing and recirculating of euro banknotes and coins in the Republic of Latvia by registering as a cash processing institution with Latvijas Banka. At the end of 2014, 85 cash processing institutions were registered in Latvia. Latvijas Banka conducted the inspections of the cash processing institutions by assessing their compliance with the requirements of the legislative acts regulating the cash processing.
Money counterfeits are checked at all flow stages retail, commercial banks, (ATM, branches), CIT and NCB.

Latest developments

The payments market has undergone systemic changes in Latvia over the past decade and continues to change rapidly. The digital age has brought changes to social and, subsequently, to payment habits. New technologies and innovative solutions bring payment services closer to their users, contributing to continuous growth in the use of non-cash payments. The regulation of payment services is being reviewed accordingly to ensure legal certainty, security and consumer protection.

The Cash Cycle in Latvia



Sources
» Latvijas Banka: Annual Report 2014

Lithuania

Macro economic figures	
Population	2.930.000
GDP	36,44 Bio Euro
GDP per capita	€ 12.437 Euro
Income level OECD index	High Income (non OECD)
Currency in circulation outside MFIs	3.169,02 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	80,23%		6
Cash transaction volume	1.264 Mio		20
ATMs	1.280	-2,81%	
	43,7 per 100.000 capita		24
	19,6 per 1.000 km^2		24
POS terminals	39.170	+0,18%	
	1.336,86 per 100.000 capita		19
	600 per 1.000 km^2		23
Cards issued per capita	1,20	-1,94%	20
ATM withdrawals - value	€ 2.614,33 per capita		17
ATM withdrawals - number	23,1 per capita	+2,06%	16
MFIs offering payment services	129	+8,33%	15
Offices of MFIs offering payment services	5.332	+32,79%	
	182,0 per 100.000 capita		1
NCB Branches	n/a		n/a
% Population with at least 1 bank account	73,80%		23
Internet penetration	68,45%		20

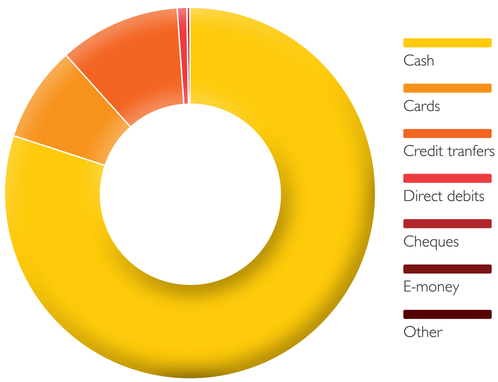
Lithuania has been part of the European Union since 2004. Lithuania adopted the Euro in January 2015. Cash is the most dominant payment instrument in Lithuania, accounting for 80% of all transactions. Lithuania ranks first in the EU for offices of MFIs offering payment services per capita, and has experienced an explosive growth of this number in recent years: +32.8% per annum to a total of 5.332 or 182 per 100.000 inhabitants.

In order to implement a more practical and effective cash supply system and to optimize cash handling processes in Lithuania the NCB started the 'reform of the cash supply system' (2015).

Cash and other Payment Instruments

The Lithuanian payment instrument mix is largely based on cash, with Credit Transfers (11%) and

Payment Instrument Mix



Cards (8%) as distant numbers 2 and 3. Direct Debits only account for 1% of all transactions.

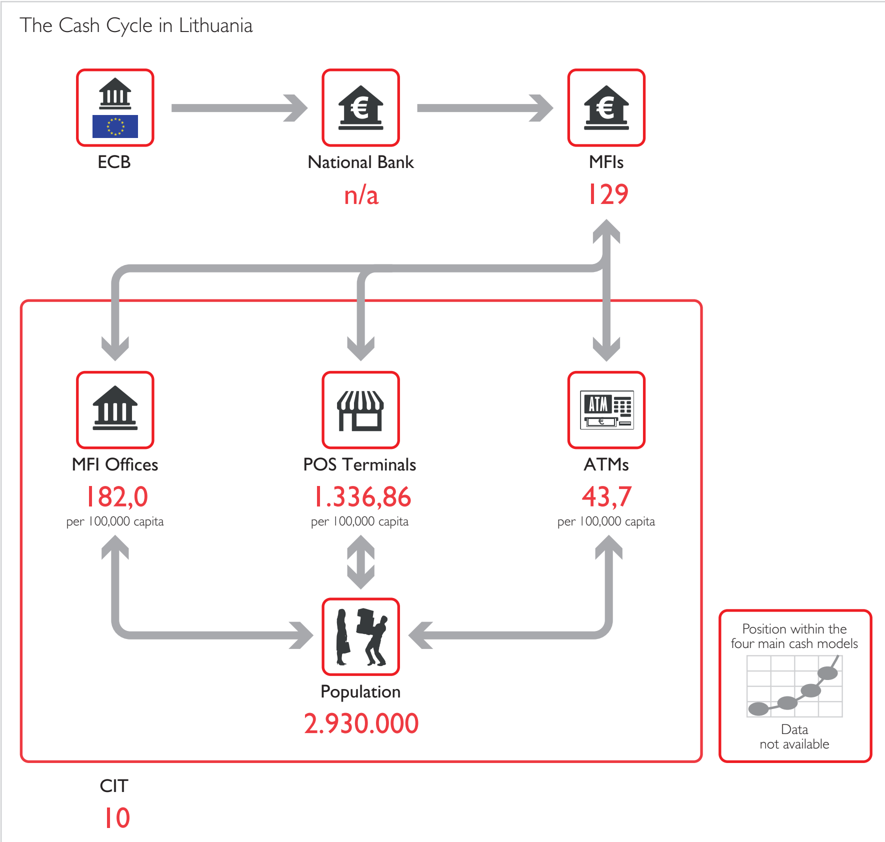
Developments 2009-2014

The increase in number of MFIs and offices of MFIs offering payment services is remarkable and tops the charts in the EU28. This could in future years lead to an increase in the precentage of the population with at least 1 bank account, as this remains far below the EU average.
The number of ATMs (- 16,9%) and Cards Issued (- 18,1%) have both declined significantly over the past years, as the number of POS terminals has increased marginally (+1,06%). The total number and value of ATM withdrawals increased indicating a need for cash in the country.

The Cash Cycle

The Lithuanian cash cycle is almost completely delegated downwards. The bank of Lithuania issues money, and after that touches it as little as possible, only taking out of circulation those bills that do not comply to fitness standards or are deemed counterfeits by the CIT companies handling them. These CITs recirculate the cash and are thus the main component of the cash cycle.

The Bank of Lithuania has set the strategic goals of the country's central bank for 2014–2016. One of them is to enhance the efficiency of the cash supply system. The Bank of Lithuania aims at optimizing cash handling processes within the country, reducing the handling costs, encouraging greater involvement of the private cash handlers in the cash handling process and improving the quality of provided services.
In order to stimulate this development the NCB has published a discussion document on the further development of the Cash Cycle in Lithuania, 2015.



Sources
» Discussion paper: reform of the cash supply system, Lietuvos Bankas, 2015

Luxembourg

Macro economic figures	
Population	560.000
GDP	48,90 Bio Euro
GDP per capita	€ 87.321 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	1.508 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	29,06%		27
Cash transaction volume	475 Mio		24
ATMs	490	+1,89%	
	87,5 per 100.000 capita		9
	189,5 per 1.000 km^2		5
POS terminals	127.560*	+183,15%	
	22.778,57 per 100.000 capita		1
	49.327 per 1.000 km^2		1
Cards issued per capita	3,79	+15,12%	1
ATM withdrawals - value	€ 4.267,86 per capita		2
ATM withdrawals - number	27,8 per capita	+19,10%	10
MFIs offering payment services	169	+2,24%	13
Offices of MFIs offering payment services	381	-3,57%	
	68,0 per 100.000 capita		8
NCB Branches	1		13
% Population with at least 1 bank account	94,60%		13
Internet penetration	93,78%		4

*The increase in the number of POSs in Luxembourg can possibly be explained by the change in reporting on POSs in a country to POSs provided by resident PSP from the country. The number of POSs mentioned here doesn't reflect the number of POSs in Luxembourg. The country specific notes provided by the ECB indicate that the number of POSs in the Luxembourg provided by PSPs from the country has increased to 14.030 in 2014.

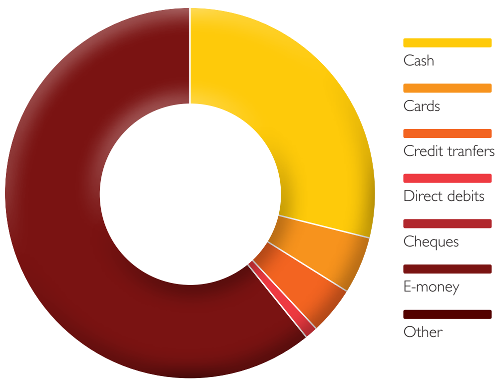
Luxembourg has one of the lowest cash percentages in the EU28, with 29% of all transactions conducted in cash. Luxembourg has the highest income level within the European Union.

Cash and other Payment Instruments

The high share of e-purchase transactions is remarkable when looking at the payment mix in Luxembourg[1]. Cash 'only' represents 29%, while Cards and Credit Transfers combined account for 9%. Direct Debits are hardly used in Luxembourg.

1 The total eMoney purchase transaction volume of Luxembourg includes the total volumes of Paypal Europe, which is located in Luxembourg. These volumes formally cannot be attributed to Luxembourg alone. When adjusted for this, Cash would also be the largest payment instrument in terms of volume in Luxembourg, representing 71%.

Payment Instrument Mix



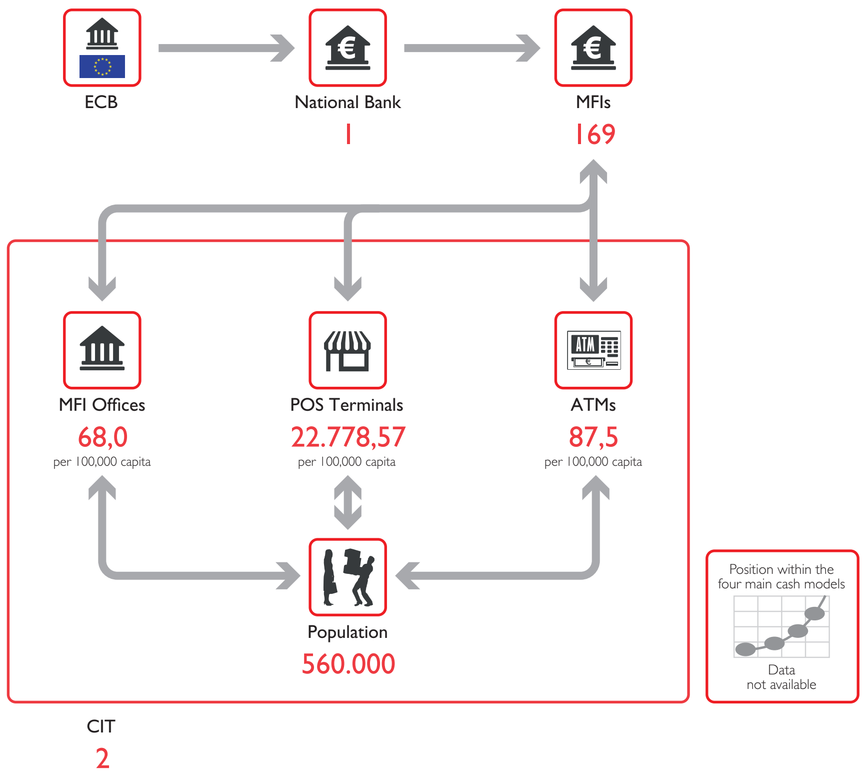
Developments 2009-2014

While the number of ATMs only increased slightly between 2009 and 2014 (+1,9% per annum, the number of ATM withdrawals jumped with 140% in the same period, mainly due to an increase in ATM withdrawals in 2012. This increase may be caused by a similarly impressive increase in the number of cards issued in the country: +90,8%.

The Cash Cycle

The volume of euro banknotes returned by financial institutions to the Banque Centrale du Luxembourg (BCL) increased by 0.1% compared to the previous year, from 92.1 to 92.2 million banknotes. Over the past ten years, banknote lodgements made at the BCL grew by 83.1%. The number of banknotes processed by sorting machines amounted to 73.3 million in 2013 compared to 77 million in 2012. 9.1 million banknotes of all denominations (8.3 million in 2012) were destroyed because they were unfit for circulation, which equals a destruction rate of 12.4% compared to 10.7% the previous year.

The Cash Cycle in Luxembourg



Country specific regulations

In an effort to combat money laundering and terrorist financing, vendors who accept cash payments of EUR 15,000 or more (whether in a single or several payment transactions which appear to be linked), must fulfill 3 professional obligations: identification of the customer, set up of an appropriate internal organization, cooperation with the Financial Intelligence Unit of the Luxembourg Public Prosecutor.

Latest developments

The bank secrecy has stopped since the beginning of 2015. This has been an obligation of Europe and Luxembourg has followed this regulation as from 2015.

Sources

» Banque centrale du Luxembourg (BCL) – Annual Report 2014

Malta

Macro economic figures	
Population	430.000
GDP	7,94 Bio Euro
GDP per capita	€ 18.465 Euro
Income level OECD index	High Income (non OECD)
Currency in circulation outside MFIs	2.100 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	82,30%		5
Cash transaction volume	148 Mio		27
ATMs	210	+2,78%	
	48,8 per 100.000 capita		22
	664,6 per 1.000 km^2		1
POS terminals	13.620	+3,18%	
	3.167,44 per 100.000 capita		2
	43.101 per 1.000 km^2		2
Cards issued per capita	1,95	+4,17%	6
ATM withdrawals - value	€ 3.720,93 per capita		6
ATM withdrawals - number	25,8 per capita	-1,08%	12
MFIs offering payment services	49	+8,85%	21
Offices of MFIs offering payment services	134	-0,60%	
	31,2 per 100.000 capita		18
NCB Branches	1		13
% Population with at least 1 bank account	95,30%		12
Internet penetration	68,91%		19

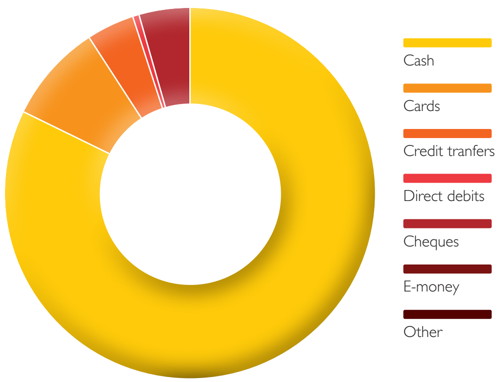
Malta relies heavily on cash to conduct payments (82%) ranking at number 5 in the EU. Malta has a high density of bank branches and ATMs per km^2, leading the EU in these categories. The Central bank of Malta intends to encourage people to switch to more innovative and electronic payment instruments, which would be cheaper and more efficient to operate.

The Maltese payment instrument mix comprises of mainly cash, about 9% consists of card transactions, and a relatively large share for payments by cheques equal to credit transfer at 4%.

Developments 2009-2014

The most notable change in the Maltese payment characteristics is the increase in the number of cards issued: +31,1% to a total of 838.000

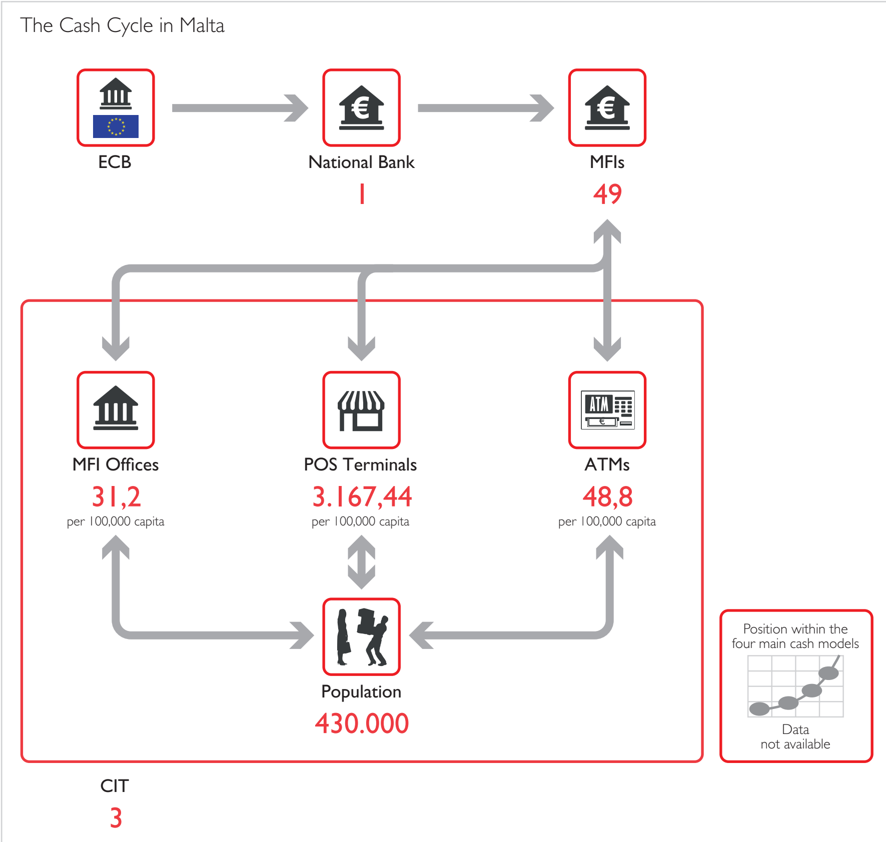
Payment Instrument Mix



or 1,95 cards per inhabitant, which places Malta at rank 6 in the EU28. Also the number of MFIs offering payment services increased significantly: since 2009 with a total of +53,3%, however the number of offices remained largely stable at 134 in 2014.

The Cash Cycle

This year The 'National Project for the Certification of Professional Cash Handlers' has been jointly developed by the Central Bank of Malta and the Financial Intelligence Analysis Unit (FIAU), with the support of the Malta Bankers' Association. The project is specifically designed to train professional cash handlers, providing them with the necessary skills to assist in the fight against the counterfeiting of banknotes as well as the prevention of money laundering and the funding of terrorism.



Sources

» Directive no 10; Directive on Authenticating, Fitness, Checking and Recirculation of Euro Banknote--s and Coins, Bank of Malta, 2013.

Netherlands

Macro economic figures	
Population	16.860.000
GDP	662,77 Bio Euro
GDP per capita	€ 39.310 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	53.505 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	36,95%		25
Cash transaction volume	3.389 Mio		11
ATMs	7.170	-2,62%	
	42,5 per 100.000 capita		25
	172,6 per 1.000 km^2		7
POS terminals	282.560	+2,61%	
	1.675,92 per 100.000 capita		14
	6.802 per 1.000 km^2		4
Cards issued per capita	1,90	+0,61%	7
ATM withdrawals - value	€ 2.897,39 per capita		12
ATM withdrawals - number	23,2 per capita	-3,08%	15
MFIs offering payment services	271	-2,51%	11
Offices of MFIs offering payment services	2.306	-5,88%	
	13,7 per 100.000 capita		26
NCB Branches	1		13
% Population with at least 1 bank account	98,70%		4
Internet penetration	93,96%		3

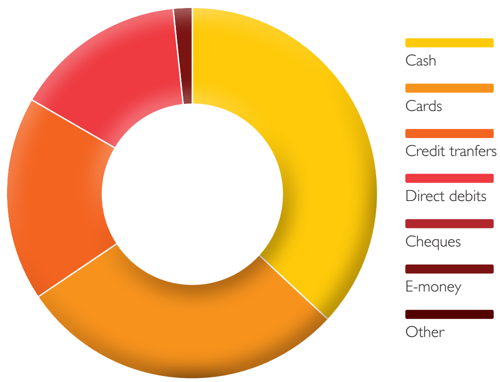
The Netherlands is one of the leading countries when it comes to the use of electronic payments. Cash 'only' represents 37% of all payment transactions. In Retail payments this percentage is higher (52%) as a recent study published by DNB shows.

Commercial banks in the Netherlands are pushing a transition from cash to electronic payments, by running campaigns changing the behaviour of the Dutch citizen. Retail establishments are struggling to strike the difficult balance between safety, costs, competitive position and consumer convenience.

Cash and other Payment Instruments

Cash is still the largest payment instrument (37%) yet (debit) cards seem to be closing in (29%).

Payment Instrument Mix



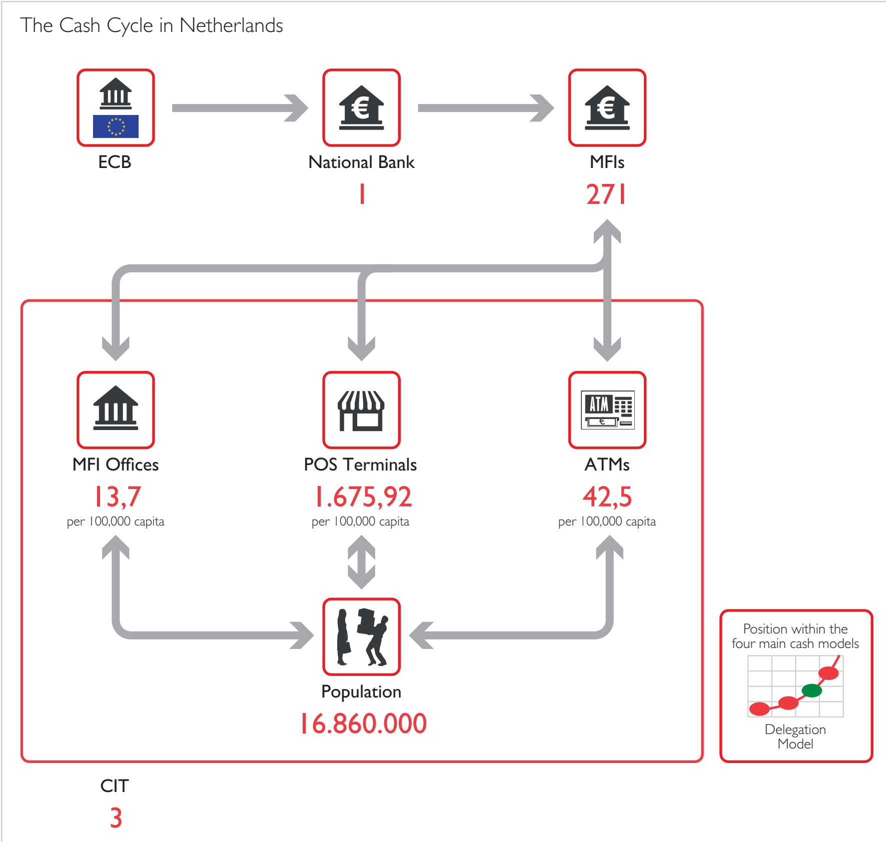
Also Credit Transfers (18%) and Direct Debits (15%) are frequently used in The Netherlands.

Developments 2009-2014

The number of offices of MFIs offering payment services has been reduced drastically in The Netherlands (-35,3 %), yet 2014 showed a slight increase to a total of 2.306. The number of ATMs continues to decline (-15,8%) to 7.170. The number of cards issued in the country has remained steady, as the market seems saturated at 1,9 cards per inhabitant.

The Cash Cycle

The Dutch cash cycle takes place at different levels. The DNB (Dutch Central Bank) is ultimately responsible for the quality of the cash supply in the Netherlands, but different technological innovations make it possible to recirculate on lower levels of the cash cycle, without breaking any of the rules and regulations regarding safety, quality and efficiency. Retailers recirculate through specific vaults that have a fitness sorting capability.



Latest developments

In 2011 the three large banks started GeldService Nederland (GSN), to provide transport, servicing and maintenance services across its network. Additional objectives are to improve the efficiency and effectiveness and to ensure continuity of cash logistics in The Netherlands.

The Netherlands was included in the Cross-Country Comparison study with Payment Diary Survey Data (2014). According to this study cash accounted for 52% of consumer transaction volume in terms of volume and 34% in terms of value.

Sources

» G4S 2011 Cash report.
» DNB Working Paper, 2015: In love with the debit card but still married to cash
» www.geldservicenederland.net
» John Bagnall, David Bounie, Kim Huynh, Anneke Kosse, Tobias Schmidt, Scott Schuh and Helmut Stix, "Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data", 2014.

Poland

Macro economic figures	
Population	38.480.000
GDP	413,13 Bio Euro
GDP per capita	€ 10.736 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	27.537,97 Mio Euro
Currency	Euro

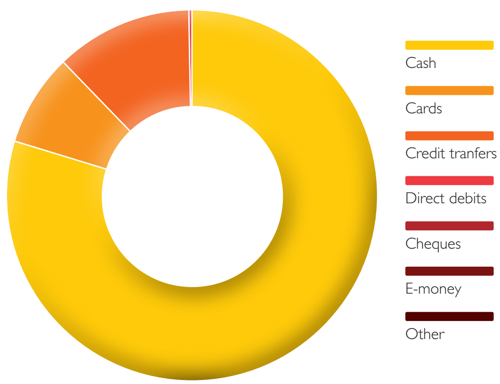
Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	79,93%		7
Cash transaction volume	11.852 Mio		6
ATMs	20.530	+4,88%	
	53,4 per 100.000 capita		19
	65,7 per 1.000 km^2		14
POS terminals	398.180	+12,11%	
	1.034,77 per 100.000 capita		24
	1.273 per 1.000 km^2		17
Cards issued per capita	0,94	+1,28%	26
ATM withdrawals - value	€ 1.836,80 per capita		25
ATM withdrawals - number	19,7 per capita	+2,58%	19
MFIs offering payment services	709	-4,04%	4
Offices of MFIs offering payment services	55.270	+7,35%	
	143,6 per 100.000 capita		2
NCB Branches	n/a		n/a
% Population with at least 1 bank account	70,20%		26
Internet penetration	62,85%		23

Poland is clearly a country in development when it comes to payments infrastructure. With 80% Poland ranks 7th in cash usage in the EU28 and scores second to last in population with a bank account (70.2%). At the same time the growth in most key indicators is impressive: the number of ATMs, MFI offices and especially POS terminals, has increased significantly over the past years. Poland is also looking at innovative payments and may be regarded as an early adapter of contactless payments.

Cash and other Payment Instruments

Cash clearly dominates the payment mix in Poland, followed by Credit Transfers (12%) and (mostly debit) Cards (8%). Direct Debits are close to non-existent in Poland.
Developments 2009-2014

Payment Instrument Mix



Poland shows impressive growth rates for most key indicators, such as POSs (+72,7%), ATMs (+29,3%) and offices of MFIs offering payment services (+44,1%) even though the number of MFIs in the country dropped (-24,3%). With 143,6 offices per 100.000 capita (2014) Poland ranks 2nd in this category.

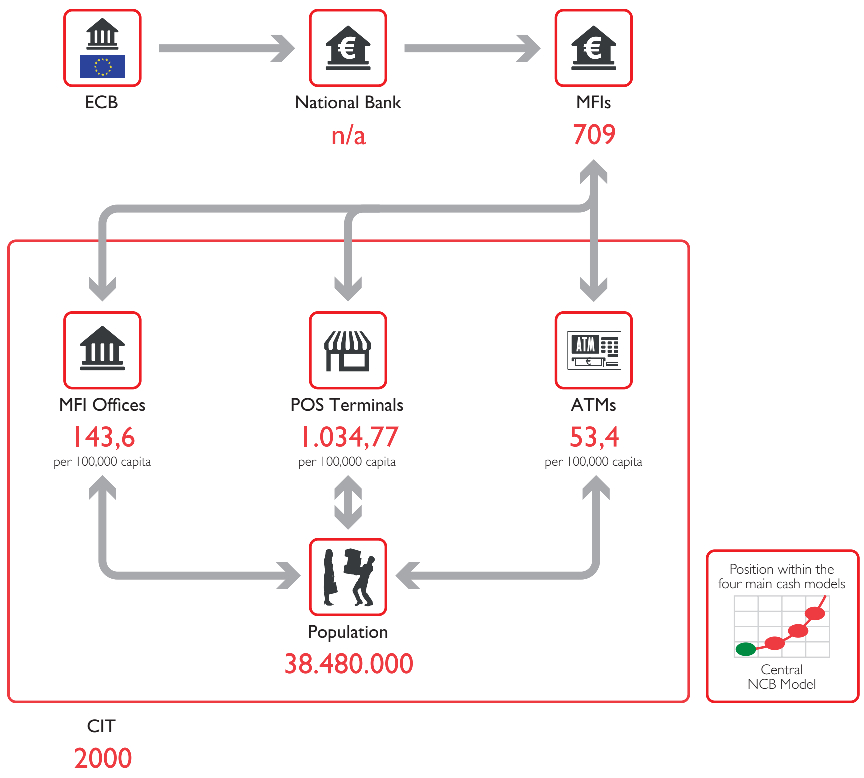
The Cash Cycle

The organisation of the Polish Cash Cycle appears to be fragmented, judging by the key indicators. The national bank of Poland plays a big role in the Polish cash cycle. With its 16 NCB branches it supplies 1.639 commercial banks with 47.521 branches. Banks are responsible for sorting of cash, yet can delegate this to one of the 5 CIT companies operating nationally. Besides these country wide CITs, there are many local CIT companies active in the country. Recirculation is done at the level of commercial banks, as they are obliged to do fitness checking and counterfeit checking when receiving the money from consumers and/or retailers.

Country specific regulations

Cash payments in Poland are limited to €15.000. Also ATM withdrawals at another bank ('guest usage') are subject to fees. These fees range between 3 and 4% of value of the withdrawal.

The Cash Cycle in Poland



Sources

» The role of the national bank in the Polish cash cycle, National bank of Poland, 2012.

Portugal

Macro economic figures	
Population	10.400.000
GDP	173,45 Bio Euro
GDP per capita	€ 16.678 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	23.299 Mio Euro
Currency	Euro

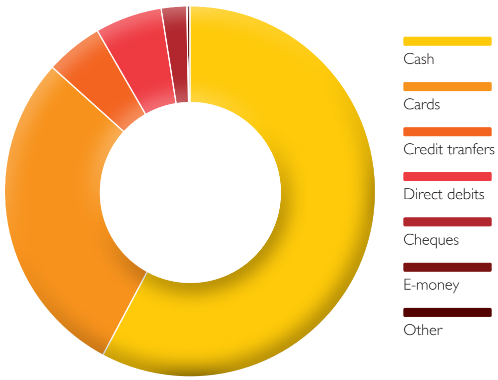
Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	57,91%		17
Cash transaction volume	2.435 Mio		14
ATMs	15.770	-1,39%	
	151,6 per 100.000 capita		2
	171,0 per 1.000 km^2		8
POS terminals	269.890	+0,97%	
	2.595,10 per 100.000 capita		8
	2.927 per 1.000 km^2		8
Cards issued per capita	1,79	-1,12%	8
ATM withdrawals - value	€ 2.931,73 per capita		11
ATM withdrawals - number	43,8 per capita	+0,40%	1
MFIs offering payment services	394	+17,18%	7
Offices of MFIs offering payment services	7.423	+0,17%	
	71,4 per 100.000 capita		6
NCB Branches	12		6
% Population with at least 1 bank account	81,20%		19
Internet penetration	62,1%		24

Even though the amount of ATMs in Portugal has been steadily decreasing in the period 2009-2013, Portugal still is number 2 in ATMs per capita and number 1 in the number of ATM withdrawals per capita. Portugal also has a relatively high number of MFI offices per capita. Internet penetration is relatively low, as is the percentage of the population with a bank account.

Cash and other Payment Instruments

Cash takes the biggest share in Portugal's payment instrument mix with 58%, doubling the share of Card payments. Direct Debits, Credit Transfers and (to a lesser extent) Cheques account for the remainder of payment volumes. The relatively high share of Direct Debits in the Portuguese payment mix is notable when compared to other EU countries.

Payment Instrument Mix



Developments 2009-2014

Portugal witnessed a tremendous increase in the number of MFIs in the country (+103,1%), yet the number of MFI offices remained largely stable (+1,1%) to 7.423 in 2014. The number of ATMs in Portugal decreased (-8,4%) to 15.770, but Portugal still has a very high availability of ATMs per capita (152 per 100.000). This could be explained by the wide range of services offered by an ATM, often extending beyond regular banking services. The amount of cards issued in the country decreased (-8,7%), while POS availability increased (+5,8%).

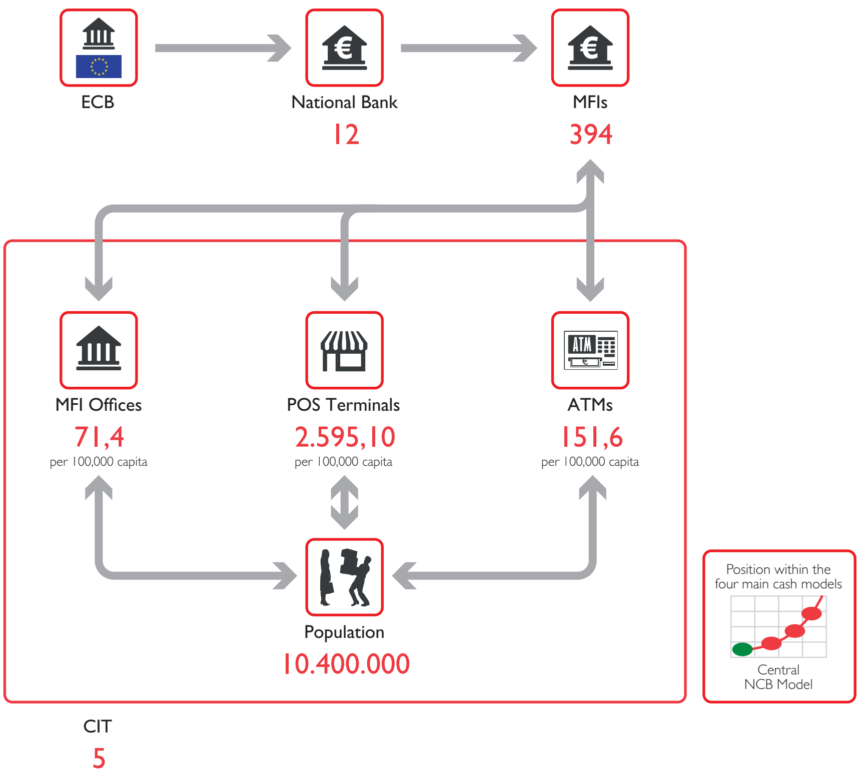
The Cash Cycle

The Bank of Portugal holds a key position in the Portuguese cash cycle. While commercial banks are obliged to do fitness checking, ultimately all cash is transported bank to the NCB for sorting and counterfeit checking before it is recirculated by the CITs. In Portugal 5 CIT companies are active; none of these hold a cross-border CIT license.

Country specific regulations

Any payment above a €1.000,- must be done in such a way that the recipient can be identified.

The Cash Cycle in Portugal



Sources

» The Central Bank of Portugal on the implementation of the Banknote Recycling Framework, Banco de Portugal, 2010.

Romania

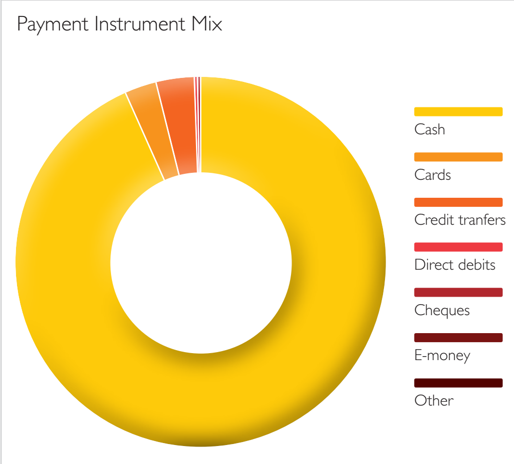
Macro economic figures	
Population	19.950.000
GDP	150,02 Bio Euro
GDP per capita	€ 7.520 Euro
Income level OECD index	Upper middle Income
Currency in circulation outside MFIs	7.781,75 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	93,39%		3
Cash transaction volume	5.168 Mio		8
ATMs	11.540	+2,76%	
	57,8 per 100.000 capita		14
	48,4 per 1.000 km²		22
POS terminals	130.520	+4,30%	
	654,24 per 100.000 capita		28
	548 per 1.000 km²		25
Cards issued per capita	0,72	+2,19%	28
ATM withdrawals - value	€ 1.371,93 per capita		26
ATM withdrawals - number	11,3 per capita	+1,25%	27
MFIs offering payment services	44	-2,83%	23
Offices of MFIs offering payment services	n/a	n/a	n/a
	n/a per 100.000 capita		n/a
NCB Branches	n/a		n/a
% Population with at least 1 bank account	44,60%		28
Internet penetration	4,976%		28

Romania relies heavily on cash for conducting payments: At 93%, it is ranked at number 3 in the EU. Even though most key figures show significant growth rates the absolute numbers are still considerably below EU averages. This holds true for ATMs (rank 14), POSs (rank 28) and Cards issued (rank 28) per inhabitant. Romania also scores lowest in the EU on inhabitants with a bank account, which is one of the reasons for the introduction of mobile payments in the country in an effort to reach the unbanked.

Cash and other Payment Instruments

With 93% Cash almost monopolises the payment mix in Romania. Cards and Credit Transfers take comparable shares of 3 and 4%.



Developments 2009-2014

ATM placement in Romania increased in this period by 16,6%, as did the number of POSs (25,8%) and Cards issued (+10,8%). The number of cash withdrawals increased with 5,3% over the period.

The Cash Cycle

The National Bank of Romania, as a central bank, has to ensure smooth cash supply. To this end, the NBR issued Regulation no. 4/2013 on checking the quality of Romanian banknotes for re-issue (Romanian only), establishing the framework for credit institutions/The State Treasury to recycle Romanian banknotes. In accordance with Regulation no. 4/2013, credit institutions/The State Treasury can recycle only the banknotes that have been classified as fit for circulation by a cash processing equipment, which has been successfully tested by the National Bank of Romania.

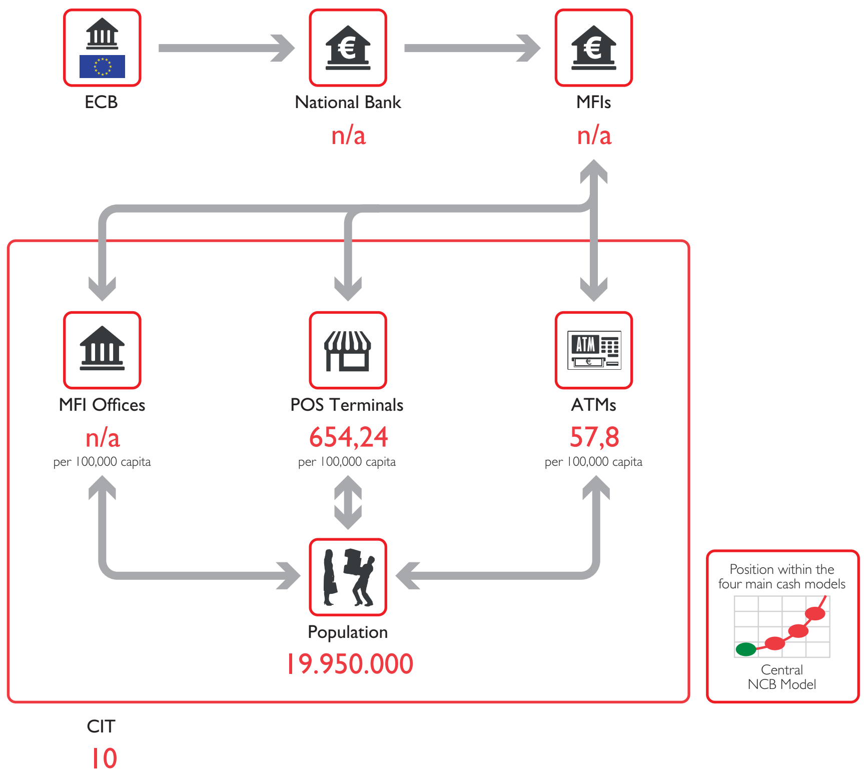
Country specific regulations

In Romania cash payments are limited at 10.000 RON per person per day (equal to 2.260 EUR).

Latest developments

Mobile payment services were launched in 2014 in Romania, with the M-Pesa mobile phone-based money transfer and micro-financing service being the most widely used mobile payment platform on an extremely narrow market. M-Pesa was first launched in Kenya and Tanzania and extended its area of coverage in South Africa and Eastern Europe in 2014.

The Cash Cycle in Romania



Sources

» Euromonitor – Report: Financial cards and payments in Romania
» Romanian National Bank – Annual Report 2014

Slovakia

Macro economic figures	
Population	5.420.000
GDP	75,21 Bio Euro
GDP per capita	€ 13.876 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	10.300 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	75,91%		10
Cash transaction volume	1.556 Mio		18
ATMs	2.710	+3,14%	
	50,0 per 100.000 capita		20
	55,3 per 1.000 km²		17
POS terminals	45.650	+4,49%	
	842,25 per 100.000 capita		27
	931 per 1.000 km²		20
Cards issued per capita	0,97	+0,50%	25
ATM withdrawals - value	€ 2.276,75 per capita		22
ATM withdrawals - number	16,5 per capita	-0,57%	23
MFIs offering payment services	41	+6,90%	24
Offices of MFIs offering payment services	3.083	+1,50%	
	56,9 per 100.000 capita		12
NCB Branches	6		6
% Population with at least 1 bank account	79,60%		21
Internet penetration	77,88%		13

Slovakia uses cash in 76% of all payment transactions, and the country can be characterized as a developing country when it comes to its electronic payment infrastructure. Particularly the number of ATMs and POSs has increased in the last years, yet the per capita numbers still remain relatively low compared to the rest of the EU.

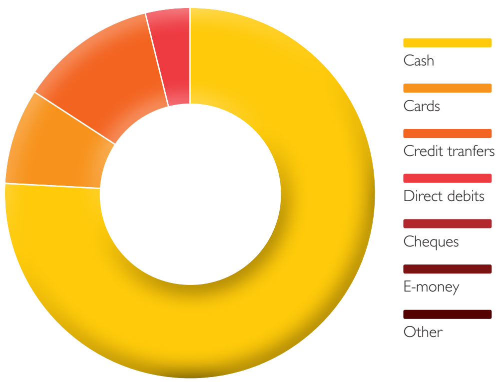
Cash and other Payment Instruments

After cash takes 76% of all transactions, Credit Transfers (12%) and Cards (8%) are the most popular payment instruments in Slovakia.

Developments 2009-2014

Access to cash improved in Slovakia in the studied period, as both the number of ATMs (+18,9%) and MFI offices (+9,0%) increased.

Payment Instrument Mix



At the same time access to alternatives is also improving as the number of POSs increased (+27,0%) as well as the number of cards issued (+3,0%). The number of ATM withdrawals declined slightly: -3,4%.

The Cash Cycle

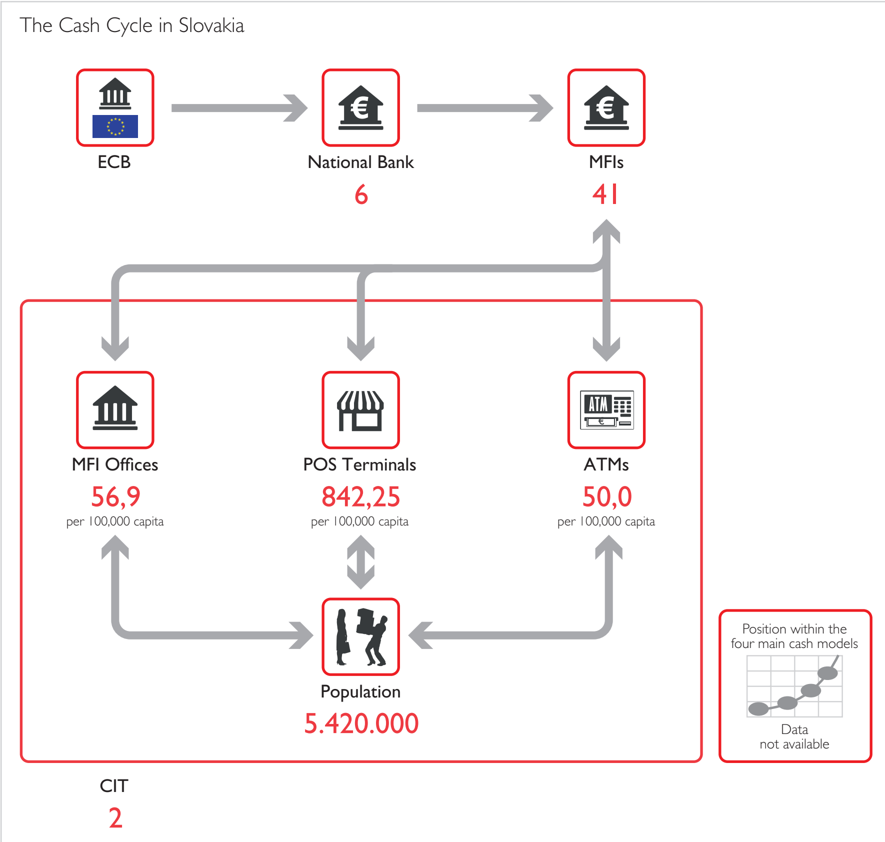
The processing and recirculation of euro banknotes and coins is performed not only by NBS, but also by commercial banks and other cash handlers, which have received approval from NBS to process euro cash. The activities of these cash handlers are subject to regular supervision by NBS. At present two cash handlers are licensed to operate in Slovakia: Bonul and Loomis, with respectively 2 and 3 cash centres in the country.

Country specific regulations

Slovakia has limited the cash payments to €5000,-.

Latest developments

In 2014 more than €374.3 million euro banknotes were put into circulation by Národná banka Slovenska, while €367.1 million were returned to NBS from circulation.



Sources

» National Bank of Slovakia - Annual Report 2014

Slovenia

Macro economic figures	
Population	2.060.000
GDP	37,30 Bio Euro
GDP per capita	€ 18.107 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	4.615 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	64,18%		15
Cash transaction volume	573 Mio		22
ATMs	1.690	-0,93%	
	82,0 per 100.000 capita		10
	83,4 per 1.000 km^2		12
POS terminals	32.880	-1,74%	
	1.596,12 per 100.000 capita		16
	1.622 per 1.000 km^2		14
Cards issued per capita	1,53	-1,34%	12
ATM withdrawals - value	€ 2.796,12 per capita		14
ATM withdrawals - number	27,8 per capita	-0,98%	9
MFIs offering payment services	30	-3,15%	28
Offices of MFIs offering payment services	597	-2,65%	19
	29,0 per 100.000 capita		
NCB Branches	1		13
% Population with at least 1 bank account	97,10%		8
Internet penetration	72,68%		17

Slovenia uses Cash in 64% of all payment transactions. Slovenia scores relatively high in ATMS per capita (rank 10) and for access to a bank account (rank 8, with 97.1%). However, most key indicators show declining trends.

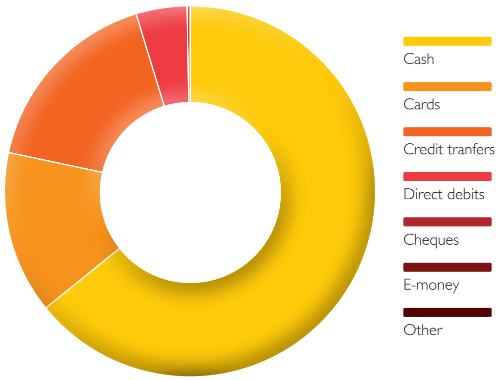
Cash and other Payment Instruments

The Slovenian payment instrument mix consists for 64% of cash, followed by Credit Transfers (17%), Cards (14%), and Direct Debits (5%).

Developments 2009-2014

The number of ATMs (-5,6%) as well as the number of ATM withdrawals (-5,0%) has both decreased in past years. The number of MFI offices also declined (-15,9%). POS availability also went down by 10,5%, while the number of cards issued decreased with 7,1% to 1.53 cards per inhabitant.

Payment Instrument Mix



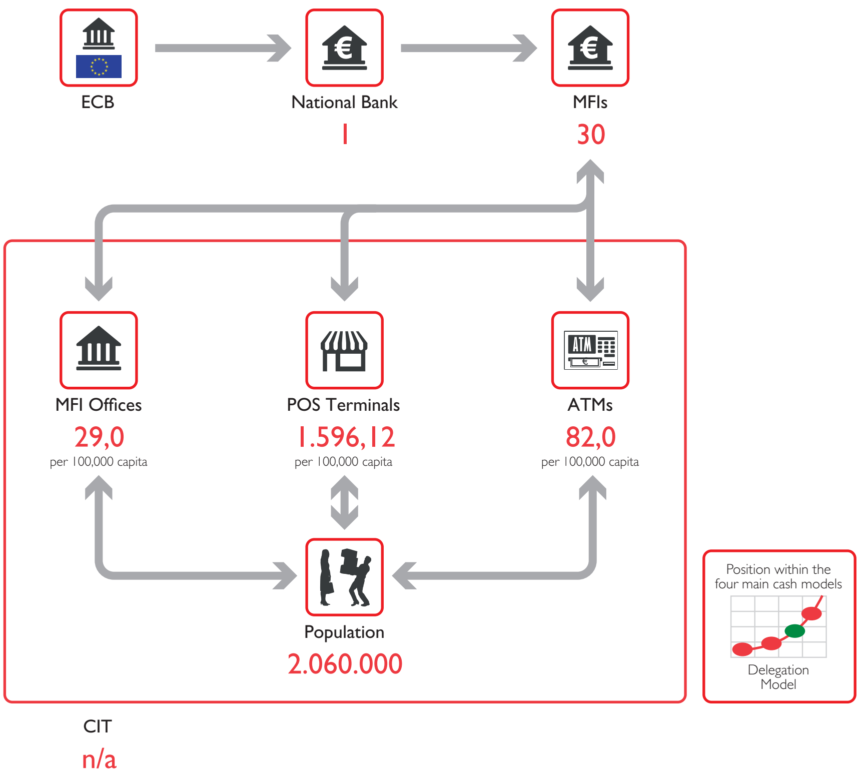
The Cash Cycle

The bank of Slovenia has a distribution network from which it distributes cash to the commercial banks in the country. There are no CIT/CMC companies that specifically fulfil the role of sorting and recirculation in Slovenia so cash depots have been set up as a co-operation between the national bank and commercial banks, to sort for note fitness and counterfeits. The Bank of Slovenia cash-processing unit sorted 30.26 million banknotes and coins, compared with 29.68 million in 2013.

Latest developments

By the end of 2014, the Bank of Slovenia had issued a net total of EUR 2.58 billion of cash into circulation since the introduction of the euro.

The Cash Cycle in Slovenia



Sources

» National plan for SEPA Cash in Slovenia, Bank association of Slovenia, 2008

» Bank of Slovenia Annual Report 2014

Spain

Macro economic figures	
Population	46.460.000
GDP	1.041,16 Bio Euro
GDP per capita	€ 22.410 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	118.152 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	74,24%		11
Cash transaction volume	16.744 Mio		3
ATMs	50.450	-2,97%	
	108,6 per 100.000 capita		3
	99,7 per 1.000 km²		11
POS terminals	1.224.110	-2,02%	
	2.634,76 per 100.000 capita		6
	2.419 per 1.000 km²		12
Cards issued per capita	1,46	-1,63%	13
ATM withdrawals - value	€ 2.400,56 per capita		20
ATM withdrawals - number	19,5 per capita	-1,59%	20
MFIs offering payment services	278	-3,58%	10
Offices of MFIs offering payment services	32.158	-4,61%	
	69,2 per 100.000 capita		7
NCB Branches	16		5
% Population with at least 1 bank account	93,30%		15
Internet penetration	71,57%		18

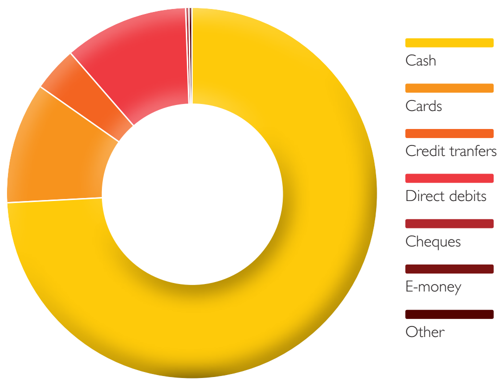
Almost 3 out of 4 transactions in Spain are conducted with cash. Spain has the highest value of cash in circulation of any other country in the European Union, however Spain shows a decline in most selected metrics, such as number of MFIs, MFI offices, ATMs, ATM withdrawals, Cards issued and POS terminals.

With close to 3 out of 4 transactions Cash is by far the most used payment instrument in Spain. Cards take 11%. Direct Debits (11%) are relatively popular in Spain, while Credit Transfers (4%) are used relatively less in Spain compared to other EU28 countries.

Developments 2009-2014

From 2009 to 2014 ATM placement in Spain has decreased from 61.379 to 50.450 (-17,8%). Also

Payment Instrument Mix



the numbers for MFIs and MFI Offices show negative growth rates (-21,5% and -27,7% respectively). Still, Spain has a relatively high amount of MFI offices per capita, ranking at number 7 in the EU. ATM withdrawals decreased with 8,5% and finally also the number of cards issued -8,8%) and POS terminals (-12,1%) decreased in the studied period.

The Cash Cycle

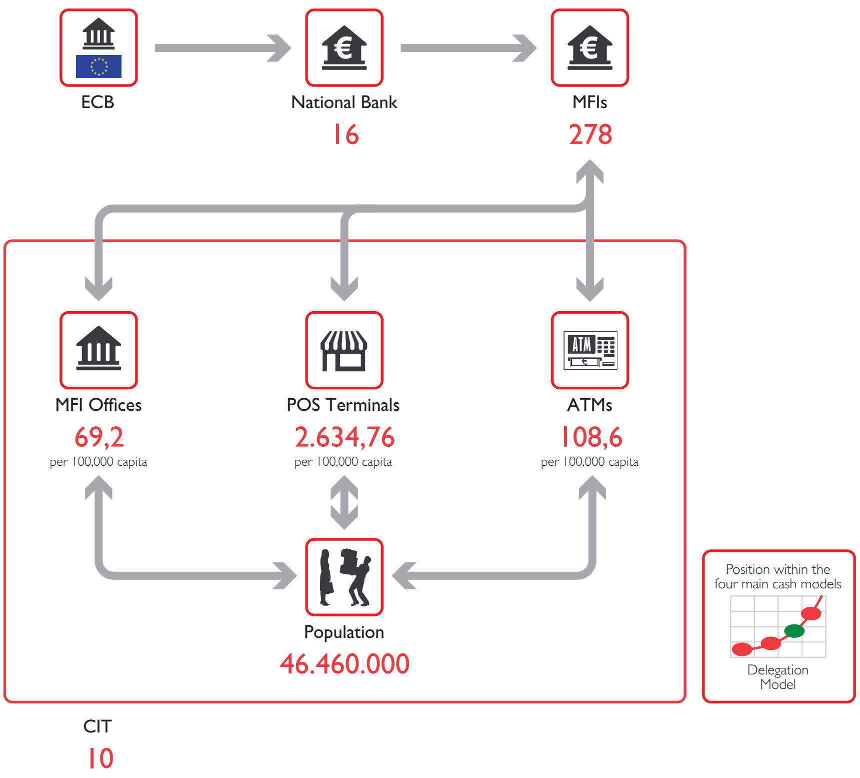
The Banco de España issues and distributes euro banknotes and coins to its network of branches and cash depots for their subsequent release into circulation. Credit institutions withdraw banknotes and coins from the Banco de España to meet the public's cash requirements, using one of the 10 cash transport companies, active in the country.

The Banco de España performs a filtering function for the cash cycle, ensuring that banknotes and coins kept in circulation are in good condition and withdrawing counterfeit banknotes and coins. Note Fitness sorting is carried out in the regional sorting centres located in the branch offices of the Banco de España.

Country specific regulations

In Spain there is a daily limit of €2,500,- cash payments for residents. Non-residents can spend €15,000,- a day in cash. ATM withdrawals regulations are highly specific per bank.

The Cash Cycle in Spain



Latest developments

Payment companies in Spain actively promote using other means than cash, preferably cards. In Spain you can now pay by credit card at parking meters as well as in taxis. These are all measures to limit Spain's hidden economy.

Sources

» Banco de Espana – annual report 2014
» Ministry of Finance (Gestha) - The underground Economy Takes its Toll, 2014

Sweden

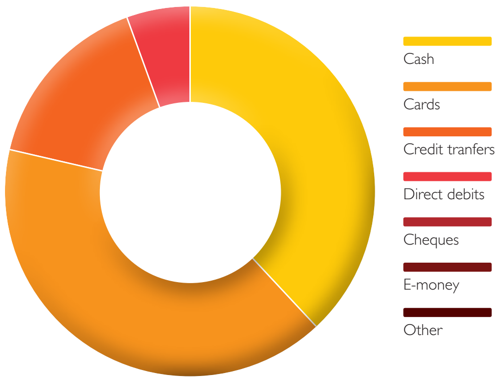
Macro economic figures	
Population	9.700.000
GDP	430,63 Bio Euro
GDP per capita	€ 44.395 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	9.296,77 Mio Euro
Currency	Euro

Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	38,29%		23
Cash transaction volume	2.076 Mio		16
ATMs	3.230	-0,45%	
	33,3 per 100.000 capita		28
	7,4 per 1.000 km²		27
POS terminals	196.990	-1,59%	
	2.030,82 per 100.000 capita		13
	449 per 1.000 km²		27
Cards issued per capita	2,28	+0,80%	3
ATM withdrawals - value	€ 2.415,46 per capita		19
ATM withdrawals - number	22,1 per capita	-3,46%	17
MFIs offering payment services	253	+6,89%	12
Offices of MFIs offering payment services	2.042	+0,82%	
	21,1 per 100.000 capita		23
NCB Branches	n/a		n/a
% Population with at least 1 bank account	99,00%		3
Internet penetration	94,78%		1

Ever since the first implementation of paper money in 1661, Sweden has been a frontrunner when it comes to payments. Sweden actively promotes the use of electronic payments (cards) over cash and, with 'just' 38% of all transactions conducted in cash, seems to be successful in that effort. Sweden scores very low in ATMs (rank 28) and MFI Offices (rank 23) per capita, yet the country has the highest internet penetration of all EU28 countries.

The bankruptcy of the Swedish cash-in-transit company Panaxia in 2012 stimulated to reconsider the role of the central bank of Sweden, the Riksbank, and the legal regulation of cash handling activities in the country.

Payment Instrument Mix



Cash and other Payment Instruments

As stated, Sweden heavily promotes electronic payments, which is reflected in the country's payment mix. Cards are leading (40%) over cash (38%).

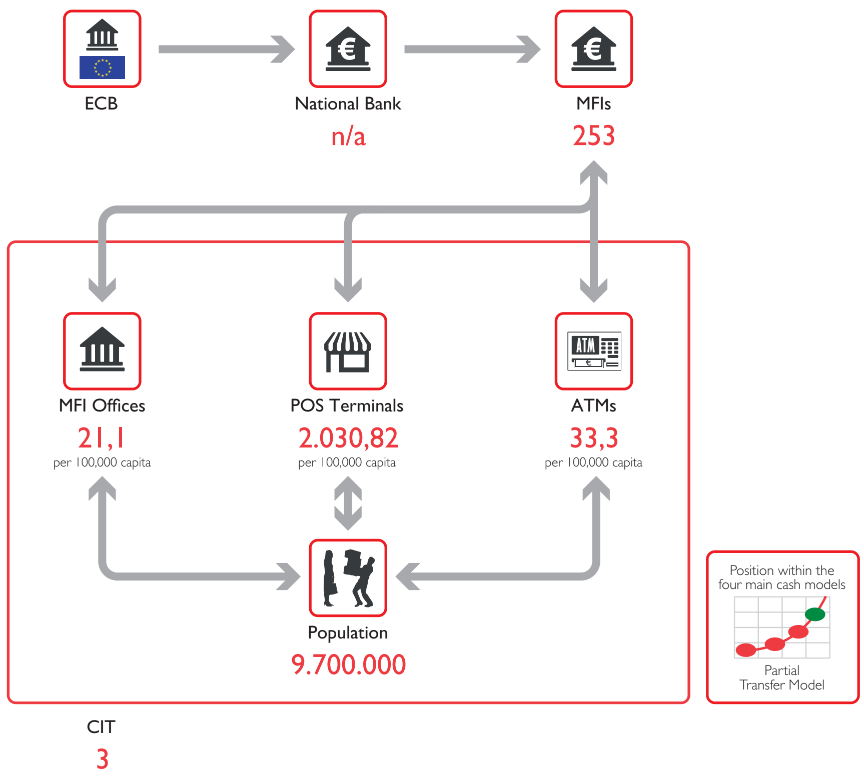
Developments 2009-2014

While access to cash was already low in Sweden, the number of ATMs declined further over the period of 2009-2014 (-2,7%) putting Sweden at last place. Perhaps consequently, the number of ATM withdrawals also declined sharply (-17,4%). While the number MFIs in the country increased significantly (+41,3%), the number of MFI offices only marginally increased (+4,9%).

The Cash Cycle

The role of the Riksbank in the cash supply system is essentially limited only to putting cash into circulation and destruction of unfit cash. The country is provided with cash by private cash handling centres controlled by banks, and operated by cash-in-transit companies. The largest cash handling centre is run by special purpose company Bankernas Depå AB (BDB), set up in 2005 by five largest banks of the country: Danske Bank, Handelsbanken, Nordea, SEB and Swedbank. The two largest cash-in-transit companies, G4S and Loomis, carry out the operational activities in this centre. Until its bankruptcy in 2012, the third largest cash-in-transit company Panaxia had also been engaged in these activities.

The Cash Cycle in Sweden



Country specific regulations

The topic of legal tender status for cash is most actively discussed in Sweden. A recent publication from the Riksbank concluded: "In the long run, it is reasonable that the unique status of cash as legal tender should cease, […] however, as cash is nevertheless still common, there is no immediate need to abolish its unique status as legal tender. […] it would be wise for the legislator to start investigating the abolishment of the unique status of cash as legal tender now."

Latest developments

Sweden is the only country in the EU28 in which Cash in Circulation, both in absolute value and as a percentage of GDP, has been declining consistently in the past years.

Sources

» Riksbank Sweden – Annual Report 2014
» REFORM OF THE CASH SUPPLY SYSTEM – Discussion paper, Lithuanian Bank, 2015.
» Björn Segendorf, Anna Wilbe; Does cash have any future as legal tender? Sveriges Riksbank: Economic Commentaries, NO. 9, 2014.

United Kingdom

Macro economic figures	
Population	64.600.000
GDP	2.253,31 Bio Euro
GDP per capita	€ 34.881 Euro
Income level OECD index	High Income
Currency in circulation outside MFIs	70.427,01 Mio Euro
Currency	Euro

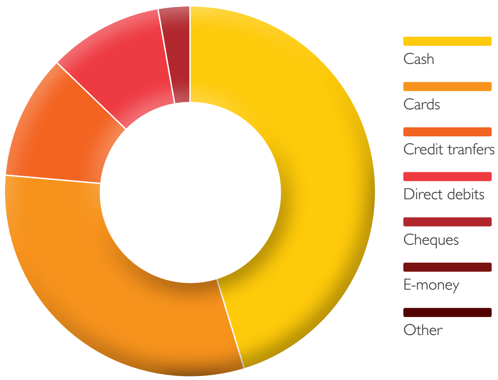
Key figures Cash	Score	Growth 2009-'14	Rank in EU28
% cash	45,28%		20
Cash transaction volume	15.312 Mio		4
ATMs	69.380	+1,93%	
	107,4 per 100.000 capita		4
	279,2 per 1.000 km²		3
POS terminals	1.701.870	+7,39%	
	2.634,47 per 100.000 capita		7
	6.848 per 1.000 km²		3
Cards issued per capita	2,46	+0,97%	2
ATM withdrawals - value	€ 3.636,22 per capita		7
ATM withdrawals - number	43,8 per capita	-1,20%	2
MFIs offering payment services	362	-1,24%	8
Offices of MFIs offering payment services	8.961	-15,15%	25
	13,9 per 100.000 capita		
NCB Branches	n/a		n/a
% Population with at least 1 bank account	97,20%		6
Internet penetration	89,84%		6

Cash is still the primary payment mechanism in the UK, covering 45% of all transactions, and 52% for consumer payments. However, also in this category the proportion of cash payments is expected to drop by 2024 to 34%, according to a recent publication of the UK Payments Council. Electronic alternatives (Cards issued, POSs) are widely available and their numbers are increasing.

Cash and other Payment Instruments

The main payment instrument in the United Kingdom is cash. However, card payments are not far behind. Card transaction volumes are growing rapidly and are expected to overtake the leading position of cash in a few years time.

Payment Instrument Mix



Developments 2009-2014

While the number of ATMs continues to increase to 69.380 (+11,6%), the number of MFI offices continues to decline rapidly (-60,6% to just fewer than 9,000). On the other side, the increase in the number of POSs is most striking (+44,3%) to 1,7 million in 2014, while also the number of cards issued increases (+10,7%). With 2,5 cards per inhabitant the UK ranks 2nd in the EU28.

The Cash Cycle

The majority of Bank of England notes pass through the traditional wholesale processing model. This involves retailers returning their cash takings to their bank, which, in turn, deposits these into the wholesale sorting system. The four wholesale processors - G4S Cash Solutions (UK) Ltd, Post Office Ltd, Royal Bank of Scotland Plc, and Vaultex UK Ltd (a joint venture between Barclays Plc and HSBC Plc) - are members of the Bank's Note Circulation Scheme (NCS). They process banknotes for authenticity and quality using increasingly sophisticated high-speed note sorters, which can check up to 30 notes a second. Good-quality, authentic notes then re-enter circulation, and are transported by cash-in-transit companies to bank branches, ATMs, and retailers. In total 14 CIT companies are active in the UK.

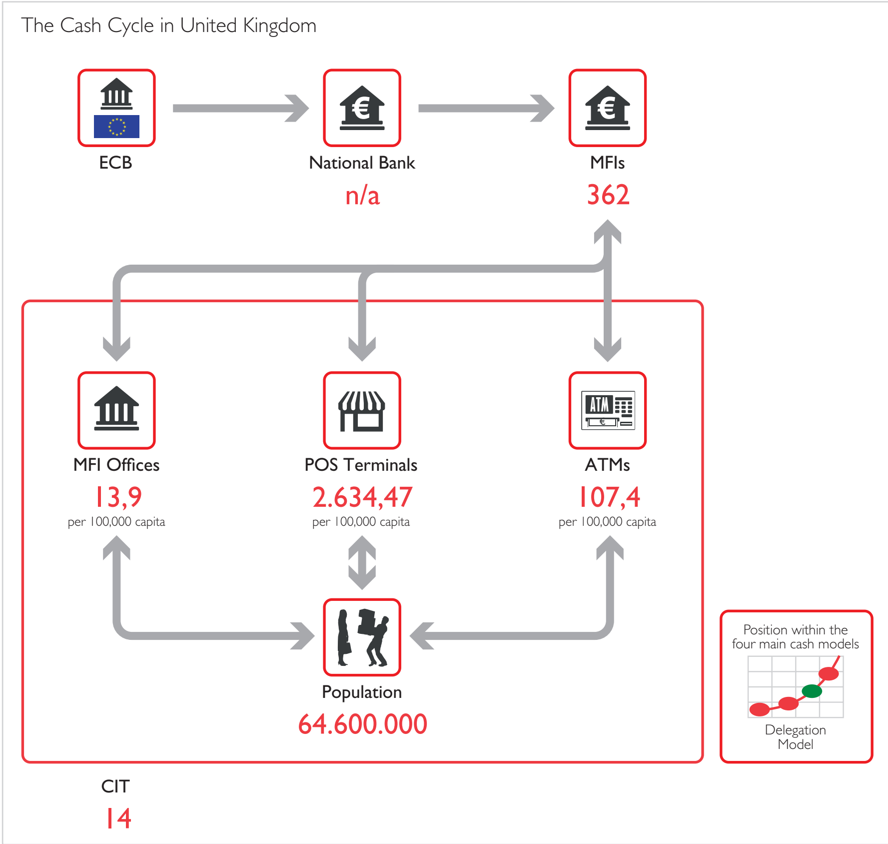
In 2014 the UK undertook a strategic review of the wholesale landscape, recognising that cash volumes would decline due to on-going migration to card based and mobile payments.

Country specific regulations

There are no limitations on cash payments; however, if you want to be able to accept cash payments of over 15,000 pounds you have to be registered as a high value dealer with the tax authorities. For ATM Withdrawals some transactions will cost between 1,- and 10,- pounds. However 97% of withdrawals are free.

Latest developments

In the UK the number of ATMs owned by IADs surpassed the number of ATMs owned by banks or Building Societies for the first time in 2014.



Sources
» Bank of England Annual Report 2014
» UK Payment Council 2015

Stakeholder Interviews

Mr Rüdiger Voss, European Commission

Mr Voss is the Head of Section DG Economic and Financial Affairs; Financial stability, legal affairs and euro cash at the European Commission. Before accepting this position in 2011, he headed several other sections within the European Commission: DG Internal Market: Public procurement policy (1998-2000), DG Justice, Freedom and Security: Customs and police co-operation (2001-2002) and DG Home Affairs: Immigration and Borders (2003-2011).

Before joining the European Commission Mr Voss worked for banking advisor for the World Savings Banks Institute/European Savings Banks Group in Brussels from 1997 to 1998.

Mr Voss holds several law degrees from Darmstadt University of Technology, University of Saarbrücken, University of Strasbourg and the University of Bonn. Since 2005, Mr Voss is a lecturer at the Postgraduate Programme in European Studies of the three Universities in Berlin (FU/TU/Humboldt).

Mr Ton Roos, European Central Bank

Ton Roos has been the Director Banknotes at the European Central Bank in Frankfurt since November 2008. Before that he was the Head of the Cash Policy Department at De Nederlandsche Bank in Amsterdam since 2002 and the Deputy-Head of the Currency Policy Department from 1999. Between 1994 and 1999 he was Plant & Technology Manager at a subsidiary company of Akzo Nobel. From 1984 until 1994 he held various R&D and management positions at Akzo Nobel. Mr Roos is the Chairman of the Banknote Committee (BANCO) of the European System of Central Banks since December 2008 and a member of BANCO between 1999 and 2008. In 2012 he was appointed as member of the Executive committee of the Central Bank Counterfeit Deterrence Group (CBCDG). He holds a PhD in solid state chemistry.

Ms Leonor Machado, European Payments Council

Leonor Machado is General Manager at Caixa Geral de Depósitos with responsibilities in the area of payments. Ms Machado has had a long career in the banking industry and gained extensive experience in cards, marketing, retail and commercial areas. She is also the Chair of the Portuguese Single Euro Payments Area (SEPA) group. With a background in economics, Ms Machado worked in various fields including international trade and cooperation and development before joining the banking sector.

Ms Ruth Milligan, EuroCommerce

Ms Milligan was Senior Advisor Payment Systems at EuroCommerce, a position she held since 2008. At the time of publication, Ms Milligan had left EuroCommerce.

Ms Milligan is a senior public affairs, advocacy and communications specialist, with recognised expertise in EU and payment systems and regulation. She has ten years experience in European policy, advocacy and lobbying.

A qualified UK lawyer, she specialises in EU competition law, internal market, financial services and payment systems, particularly cards, the Single Euro Payment Area (SEPA), e-commerce and m-payments.

Ms Milligan is a frequent speaker at EU-level conferences on retail financial services.

EuroCommerce has validated all quotes and other relevant content related to EuroCommerce used in this report.

Mr Farid Aliyev, BEUC

Mr Aliyev is the Senior Financial Services Officer at European Consumer Organisation BEUC responsible for retail Banking services, Financial supervision & regulation, over-indebtedness, and Payment services.

BEUC (Bureau Européen des Unions de Consommateur) acts as the umbrella group in Brussels for its members and our main task is to represent them at European level and defend the interests of all Europe's consumers. BEUC's members now include 41 well-respected, independent national consumer organisations from 31 European countries (EU, EEA and applicant countries). BEUC investigates EU decisions and developments likely to affect consumers, with a special focus on five areas identified as priorities by our members: Financial Services, Food, Digital Rights, Consumer Rights & Enforcement and Sustainability.

Mr Thierry Lebeaux, ESTA

Thierry Lebeaux has over 25 years' experience in public affairs and political communications. After graduating in economics and international relations in the University of Lille, he specialized in European studies in the College of Europe of Bruges.

Later he started his career working for seven years in the European Commission in the Directorate General for industrial Affairs and Internal Market, dealing with matters related to cross border trade in services and in competition cases within the service industry.

Mr Lebeaux then run a number of consultancy offices in Brussels for 15 years, advising a multitude of international clients on EU issues.

In 2009, Mr Lebeaux joined Japan Tobacco International as Vice-President EU Affairs to run their EU office ahead of the revision of the tobacco products directive. Since the end of 2013, Mr Lebeaux has returned to consultancy, and took responsibility for ESTA as Secretary General in 2014.

Overview of cash restrictions per EU country

Country	Cash Limit	Details	ATM Withdrawal Costs	Details
Austria	No		No	Some very small banks charge if using an ATM owned by different bank.
Belgium	Yes	€3,000,- for goods and all sorts of services.		
Bulgaria	Yes	Limited at 14,999 Leva. (roughly €7670-)		
Croatia	No			
Cyprus	No			
Czech Republic	Yes	350.000 CZK per day (roughly €14.000-) or up to 50 coins.		
Denmark	No	Not yet. Legislative proposal that is not yet adopted might make buyers and service retailers jointly responsible for the taxes that need to be paid over the transaction amount. From 10.000 DKK and up (approximately €1,340-)		
Estonia	No			
Finland	No	Cash can be denied as payment means, if stated clearly before making sale	No	Some very small banks charge if using an ATM owned by different bank.
France	Yes	€3000- for fiscal residents and €15.000 for non-residents acting as consumer. At government offices cash payment are restricted to €300-		
Germany	No		Yes	When using ATMs from other companies. From €1.95 up to €5-
Greece	Yes	Limited at €1500,-		
Hungary	Yes	No limit for consumers, but legal persons that are required to open a bank account can only make payments up to 1.5 million HUF per month. (roughly €5000-)		
Iceland	No			
Ireland	No	In practice high value notes are rarely accepted	No	
Italy	Yes	Limited at €999,99		

Country	Cash Limit	Details	ATM Withdrawal Costs	Details
Latvia	No			
Lithuania	No			
Luxembourg	No			
Malta	No			
Netherlands	No	Unusual transactions might have to be reported	No	But you can only withdraw once a day at ATMs owned by other banks.
Norway	No	Checks rarely accepted	No	
Poland	Yes	Limited at €15.000,-	Yes	Withdrawal at own bank mostly free, at other banks subject to percentages. (3%-4%)
Portugal	Yes	Any payment above €1000- should be made in such a way the recipient can be identified.	No	
Romania	Yes	Limited at 10.000 RON/pp per day. (roughly €2260-)		
Slovakia	Yes	Limited at €5000-		
Slovenia	No			
Spain	Yes	Limited at €2500- for residents €15000- for non-residents.	Yes	Amount highly depends on bank.
Sweden	No	Cash can be denied as payment means, if stated clearly before making sale	No	
United Kingdom	No	But traders accepting cash payment of more than €15.000 have to register as 'High Value Dealer' with tax authorities.	Yes	For a limited amount of transaction; Ranging between 1- and 10 pounds. 97% of withdrawals remain free.

Sources: European Consumer Centre France;
www.europe-consommateurs.eu/en/consumer-topics/buying-of-goods-and-services/cash-payment-limitations/

Stakeholder impact per future scenario – initial analysis

Stakeholder	1. Fragmented cash Current situation and status quo	2. Single European Cash Area - SECA High integration	3. Digital Integration High Integration No Cash	4. Digital Fragmentation No Integration No Cash
European/National Central Bank	Current situation and status quo. Role of XCB will largely remain the same, with a continued delegation of operational tasks to commercial parties.	Role of ECB will increase with a more centralised approach to cash. NCBs can further retract from operational activities in cash cycle.	ECB and NCB would not have to establish or issue the amount of cash and can focus solely on electronic payments. New entrants (also from outside the traditional financial institutions and from outside the EU or even transcending national borders (virtual currencies)) pose new challenges for XCB's oversight.	With little to no cross border integration the role of NCB's will increase. However, since there's no cash, NCB's no longer have to (actively) participate in the cash cycle. Their focus can fully be on electronic means of payment.
Commercial Banks	Banks are focussed on cost control and for them cash is an expensive product. Within this scenario they will try to find ways to optimise cost efficiency as much as possible, either within cash or by promoting other (non-cash) payment instruments with a better cost-benefit ratio.	Opportunities for multinational/pan-European approach to cash handling; with potential for further cost savings. Cost savings also from increased standardisation.	No cash means less cost for the banks, which can now focus on more profitable electronic payment instruments. Full integration and standardisation does mean banks will have to find ways to provide these services in a differentiating and valued way.	Local kingdoms are back! All the results from SEPA so far will be reversed and local products are back including the increased cost for running multiple systems/products and integration across countries.
CIT/CMC Companies	CITs are needed to transfer cash within national borders. Compliance to multi-domestic regulations. Competition on national level	Open and standardised market for cash and cash logistics increases the competition between CITs. CITs should find economies of scale or other differentiators in order to remain profitable. See also trend on: CIT to CMC. Consolidation can be expected.	Since there's no cash to be transferred there's no market for Cash in Transit companies. Even though this is unlikely in its most extreme form, CIT do need to anticipate on decreasing volumes and find other/additional ways to stay profitable.	idem

Stakeholder	1. Fragmented cash Current situation and status quo	2. Single European Cash Area - SECA High integration	3. Digital Integration High Integration No Cash	4. Digital Fragmentation No Integration No Cash
Consumers	With the Euro in place in 19 EU countries; the Cash integration in Europe is already largely a reality for many consumers	For consumers this would ultimately mean: all EU countries join the Euro. No exchange rate or "foreign" currency left within Europe.	No cash yet full integration of electronic payment instruments. All consumers need to have access to this infrastructure. As we've seen in earlier chapters this is not yet the case in many, if not all, countries.	Consumers will experience a world in which there's no cash, yet there is also no integration across EU member state borders. For consumers this will be cumbersome, but not a big problem as 99% of all consumer transactions is done within the country of residence.
Retailers	Acceptance of cash (euro/non-euro) is not a problem. Transport within national borders is organized with increasing possibilities for some cross-border CIT.	Only euro would make things even easier for Retailers. Also the standardisation in the market would allow for greater cost efficiency and multi-national tenders could bring economies of scale benefits.	All Retailers need to be able to accept electronic payment instruments. As we've seen in earlier chapters this is not yet the case in many, if not all, countries.	Retailers are not only forced to accept electronic payments, but they have to accept a fragmented amount of them, increasing cost-inefficiency.
Regulator	Sufficient regulations already in place and no direct need for more regulation.	This would ask a lot of the regulator as this requires not only standards to be set and maintained yet also to be adopted and controlled. Furthermore, these standards not only apply to cash or cash logistics yet also to other related domains (security laws, HR, wages, taxes, etc.)	In its most extreme form, in this scenario there's no longer a need to regulate cash.	Regulation of electronic payment instruments will take place on national level.

Glossary

ATM	Automated Teller Machines
BEUC	European Consumer Organisation
B2B	Business to Business
B2C	Business to Consumer
BSR	Balance Sheet Relief
CB	Central Bank
C2C	Consumer to Consumer
C2B	Consumer to Business
CIT	Cash in transit
CMC	Cash Management Company
EC	European Commission
ECB	European Central Bank
EPC	European Payments Council
ESTA	European Security Transport Association
GDP	Gross Domestic Product
IAD	Independent ATM Deployers
IBNS	Intelligent Banknote Neutralisation System
MIF	Merchant Interchange Fee
MFI	Monetary Financial Institution
NCB	National Central Bank
NCS	Note Circulation Scheme
NFC	Near Field Communication technology
NHTO	Notes Held To Order
POS	Point of Sale terminals.
SECA	Single Euro Cash Area
SEPA	Single Euro Payments Area
PSD	Payment Services Directive
PI	Payment Institution
TPPSP	Third Party Payment Service Provider

Sources

- Van Dale Dictionary
- Bank of England, statistics
- ECB Statistics, June 2015 & October 2015 www.ecb.europa.eu
- ECB - Occasional Paper series Nr 137: The Social and Private Cost of Retail Payment Instruments – a European Perspective, 2012
- ECB - Working Paper Series no 1685: June 2014, Consumer Cash usage - a Cross-Country Comparison With Payment Diary Survey Data
- EC - www.ec.europa.eu
- EC - Survey on merchants' costs of processing cash and card payments Final results, European Commission, Directorate-General for Competition, March 2015
- ECommerce News - www.ecommercenews.eu
- ESTA - Overview of Cash Logistics Industry, 2012, ESTA publication.
- European ATM Security Team, 2015 www.european-atm-security.eu
- EPC - www.europeanpaymentscouncil.eu
- European Consumer Centre France www.europe-consommateurs.eu
- Fasterpayments - www.fasterpayments.org.uk
- Federal Reserve Bank of San Francisco - 2012 Annual Report
- Presentation EC, ESTA conference, Berlin 2015
- www.tradingeconomics.com
- www.statista.com
- Wikipedia - en.wikipedia.org
- www.new-euro-banknotes.eu
- World Bank 2014, Global Financial Development Report, Financial Inclusion

About us

G4S

G4S Cash Solutions provides for and develops new security concepts that enable market players such as retailers and banks to manage cash money easily. The business is part of G4S, the leading global, integrated security company, specialising in the provision of security services and solutions to customers. Our mission is to create material, sustainable value for our customers and shareholders by being the supply partner of choice in all of our markets. G4S is quoted on the London Stock Exchange and has a secondary stock exchange listing in Copenhagen. G4S is active in over 100 countries and has 611,000 employees. For more information on G4S, visit www.g4s.nl.

Payments Advisory Group

Payments Advisory Group is an international consultancy specialized in the payments domain, working together with all stakeholders, including payment processors, banks, corporates, public sector organisations and special interest groups. Payments Advisory Group provides advisory and implementation services, interim management and market research.
Payments Advisory Group's expertise covers all relevant regulations and product domains, such as Cash, Non-cash/Bank payments (including SEPA), Cards, Internet/Mobile/Virtual and Cash & Treasury Management. www.paymentsadvisorygroup.com

G4S Cash Solutions
PO Box 2045
3500 GA Utrecht
The Netherlands

www.g4s.com

Payments Advisory Group
World Trade Center
Zuidplein 36 H-Tower
1077 XV Amsterdam
The Netherlands

www.paymentsadvisorygroup.com

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Key authors
Paul van der Knaap, Taco de Vries

Author
Karin Tielenius Kruythoff

Editorial assistance
Trace Norton, Alex Shephard, Nicole Bauritius, Nigel Fairbrass, Matthew Magee, Bas Rodenberg

Data research
Taco de Vries, Anne Raaijman

Production
Karin Tielenius Kruythoff

Design
Studio MM, Eric Sijtsma, Eck en Wiel

Photography
Getty Images, Adobe Stock, Shutterstock, Eric Sijtsma, Elena Burn, G4S

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