The Future of Cash

2006

CPR Billets

SCAN COIN

AGIS CONSULTING

Acknowledgements

Four years after the introduction of the physical euro, the largest ever logistical peacetime operation, cash remains the most widely used payment instrument … and for many financial institutions a logistical nightmare.

The euro has largely contributed to put cash in the limelight – forcing all the constituents to review their processes and reconsider their role in the currency supply chain. As a result, the cash industry is undergoing profound changes.

This report is aimed at understanding the ongoing forces which are driving change. It is not our intention to provide all the answers but rather we hope to inspire innovative thinking and new responses for the various actors in the cash cycle. Given the continued use of cash in the economy, it is essential for the financial industry to plan for its efficient delivery to the consumers as well as for the improvement of the productivity of cash processing.

This report was sponsored by CPR Billets and SCAN COIN. The research was undertaken by Guillaume Lepecq, Director of AGIS Consulting. The views expressed here do not necessarily reflect those of CPR Billets, SCAN COIN.

We would like to take this opportunity to thank all those who have agreed to share their expertise for the purpose of this research.

"Not everything that can be counted counts,
and not everything that counts can be counted."

Albert Einstein

About us

CPR BILLETS

www.cprbillets.com

➤ **CPR Billets** is the leading wholesale foreign exchange operator for banknotes and travellers cheques on the French Market. It provides the French banking network with foreign banknotes for French tourists preparing their travels abroad or collects foreign banknotes from incoming tourists.

In the context of its diversification strategy, **CPR Billets** is extending its range of services to the management of euro cash centres, thus bringing its expertise in terms of the rationalisation of workflows and the handling of foreign currency to the processing of euro banknotes.

CPR Billets is completing its range of services thanks to its security Cash-In-Transit subsidiary and is shortly due to announce the implementation of its proprietary system of alternative transport, which is the first device to have been certified according to the new French regulatory standards, applicable as of January 2004.

SCAN COIN

www.scancoin.com

➤ Founded in 1966 in Malmö, Sweden, **SCAN COIN** became a leading company of cash handling equipment thanks to a unique electronic detection system developed in 1988 which prepared the way for a more exact coin counting method than the world had ever seen before. Vigorous investments in research and development resulted in one successful innovation after the other so that high-speed machines from **SCAN COIN** processed coins all around the world.

It also made the successful self-service Cash Deposit Systems possible. **SCAN COIN** has supplied more than 10,000 CDS machines to banks and other customers worldwide.

SCAN COIN always focus on working as closely as possible with the customer and offer integrated solutions that enable them to process cash efficiently all over the world through a network of **SCAN COIN** companies and distribution partners covering some 120 countries.

AGIS CONSULTING

www.agis-consulting.com

➤ **AGIS Consulting** is an independent strategy consulting firm, specialised in retail payments, including cash and payment cards. **AGIS** was founded in 2001 in Paris and has since developed a worldwide network of partners.

The European retail payments market is facing tremendous change, under the combined pressures of the evolving regulatory market and European integration, technological innovation and socio-economic factors. **AGIS** aims at providing its clients with out-of -the box thinking, in order to anticipate the changes in the market and develop customized value-added solutions.

Clients range from financial institutions, to payment service providers, to soft and hardware vendors.

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Executive Summary

Contrary to common perceptions, cash remains by far the most frequently used payment instrument in Europe and the world. It is estimated that between 60 and 95% of transactions are still made in cash. Cash is doing more than showing resilience: it is the dominant retail payment instrument. The value of euro banknotes in circulation has almost trebled since the launch of the euro.

Non-cash payment instruments have been challenging cash for the past 50 years. While electronic payments have experienced considerable success, cash remains the preferred instrument particularly for low-value transactions. Card schemes and issuers are promoting new weapons to for what they have called the "War on Cash" and in particular contactless and pre-paid cards. It remains to be seen whether consumers will use these instead of cash or whether these new payment instruments will cannibalise existing electronic products. From a technical standpoint, a cashless society is feasible; it is the end consumer who chooses to continue to pay with notes and coins.

The move towards a Single Euro Payments Area (SEPA) poses a further challenge to cash as it aims at improving the efficiency of electronic payments. SEPA will not only impose significant investments for the financial industry but it also pressures margins on payments. Banks will attempt to compensate the lower revenue by increasing transaction volume and displacing cash.

Cash is expensive but so are payments. It is perfectly acceptable if cash is replaced by other payment instruments as long as this is done for the right reason, i.e. better efficiency. Authoritative studies published by the Central Banks of the Netherlands and Belgium, show that the overall cost of payments amounts to respectively 0.65% of GDP in the Netherlands and 0.74% in Belgium. Cash payments remain more cost-efficient for low-value payments. Both studies show that replacing cash by electronic payments would only result in marginal savings: in Belgium the "electronification" of 25 % of cash transactions would save 0.02% of GDP.

As long as the full displacement, of cash appears unfeasible in the foreseeable future, it is important to ensure the efficiency of cash as a payment instrument. Three main areas offer room for improvement:

- Ensuring an efficient cash cycle in coordination with all the stakeholders
- Optimising the handling of cash by increasing automation, reengineering the processing chains and improving the management information systems
- Automating the collection of cash which remains the most costly element of the cash cycle.

Ever since the introduction of the euro, National Central Banks have been reconsidering their role in the supply chain. Changes have been driven both by technology and the objective of cost efficiency. While different National Central Banks have been following different models, the general trend is leading to the shifting of the physical handling of cash to the commercial banks. It is therefore important to monitor the performance and evolution of the various different models in the future.

Commercial banks play a major role in the supply of cash as they are the link between the Central Bank and the cash users. Considering the importance of cash as a payment instrument and its cost - which can represent as much as 15% of total operating costs - banks are increasingly recognising the strategic importance of efficient cash handling. Key drivers for enhanced efficiency are the increased use of automation; the implementation of straight-through processing and the improved partnership with the cash-in transit industry and cash processors.

The collection of cash is the one area which represents significant potential savings. It is the most costly part of the cash cycle and the least automated. The deployment of automated deposit would contribute to improve the productivity of an activity which remains highly labour-intensive today. It is also in line with banks' strategies to withdraw cash from the bank branches.

Another sign of the vitality of the industry is the arrival of new entrants in the marketplace. Independent deployers now manage significant ATM estates in some European countries either on behalf of banks or on their own account. A manufacturer of cash-handling solutions is now operating cash centers in Germany. These actors are a source of innovation either through new technology or new business models.

For the majority of banks, cash is still isolated in a silo and treated exclusively as a cost centre. Yet cash is an integral part of a payment system, which includes a variety of instruments. Each instrument has its advantages and disadvantages depending on the circumstances and they all complete each other rather than compete against each other. This is illustrated by the fact that almost a third of card transactions are actually cash withdrawals. Cash needs to be integrated into a holistic payments strategy; banks could then focus on the profitability of the overall system rather than that of specific silos.

1 Cash in the economy

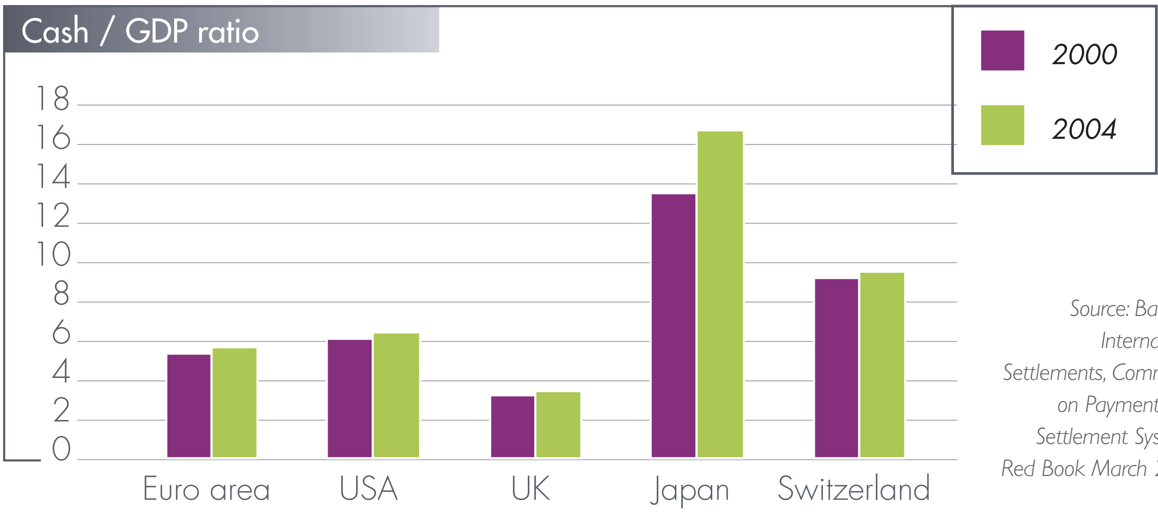
The weight of cash in the economy

Over the past 40 years, the weight of cash in modern developed economies has declined steadily as various payment instruments have been developed as alternatives to cash. These include cheques, bank transfers, debit and credit cards, pre-paid cards… While the majority of these instruments have been issued by banks, or interbank organisations, non-financial companies have also provided payment instruments and in particular retailers. To be universal however, payment instruments need to involve an intermediary.

In several countries - UK, France - the value of card transactions has exceeded that of cash payments. Notes and coins now represent only a small portion of the overall wealth.

However, during recent years, the weight of cash in the economy has remained stable and even in slight increase. This raises the issue of the optimal level of cash in the economy. Indeed, in modern economies, the majority of consumers have a variety of payment instruments to choose from. One could expect that consumers actually use the optimal mix of payment instruments, on the basis of their respective merits.

1 Cash / GDP ratio

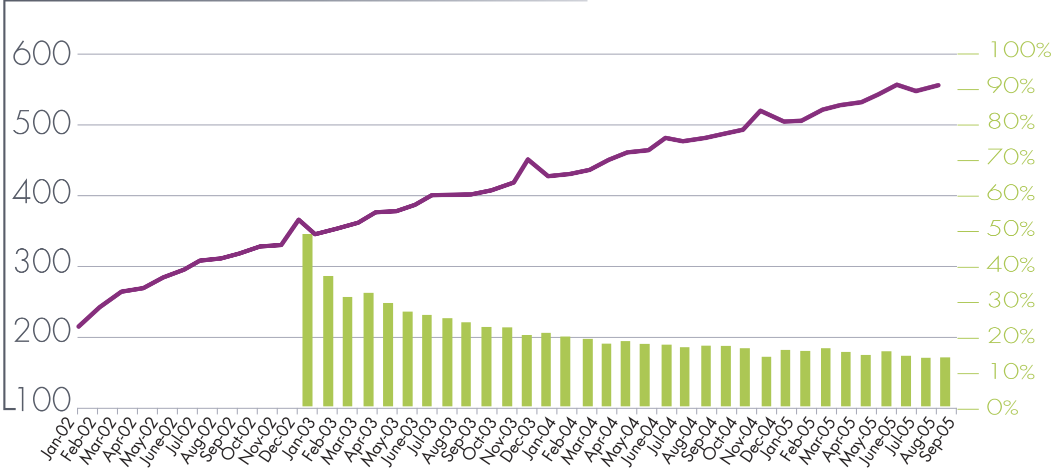


Source: Bank for International Settlements, Committee on Payments and Settlement Systems, Red Book March 2006

Since the euro was launched, the volume of cash in circulation has grown by over 15% per year. The vast majority, of this increase is due to hoarded currency as is demonstrated by the value of high-denomination notes. In 2004, the 500, 200 and 100 euro denominations represent over half the total value of notes in circulation. The total face value of EUR 500 notes in circulation exceeds 30% of the total face value of the entire circulation of euro banknotes.

The internationalisation of the euro – i.e. its use by non euro-zone residents – also justifies this strong growth. It is clear that the euro is widely used in neighbouring EU countries and particularly the former Yugoslav countries and Russia. By mid-2004, shipments of euro banknotes by banks outside the euro zone exceeded EUR 45 billion but this represents an incomplete picture as non-bank channels are also used such as tourists, migrant workers, underground economy… As a point of comparison, it is estimated that roughly half of the US dollar notes were held abroad in 2000.

2 Value of euro banknotes in circulation



Source : ECB

Other countries have also experienced similar growth rates. In the United Kingdom, the value of notes in circulation has exceeded GBP 36 billion at the end of 2004, a 45% increase since 1999. The value of US dollars in circulation has increased by 400% between 1980 and 2005, from USD 160 to USD 700 billion. Over the same period, the number of USD 100 notes has risen by 465%.

The societal role of cash

Beyond its economic weight, cash also plays important societal role.

For important segments of the population, cash is the only available means of payment. These include: the unbanked, youth, the illiterate or the visually impaired.

The euro is legal tender throughout the euro-zone- from uninhabited Greek islands to the top of the Mont-Blanc, to the jungles of Guyana. The cost of building a non-cash payments infrastructure in remote areas or areas with low transaction volumes would be excessive.

Cash is the most efficient debt management tool. As opposed to most electronic payments, consumers can see it disappear at it is spent. In this respect it is an important way to avoid excessive debt particularly for the most fragile segments of the population who are often subjected to alluring advertising on behalf of credit institutions.

Cash is central-bank money and as such provides a stable, secure, government-backed payment instrument which protects the privacy of consumers and is an alternative to those who distrust the banking sector.

Cash remains the most widely used payment instrument

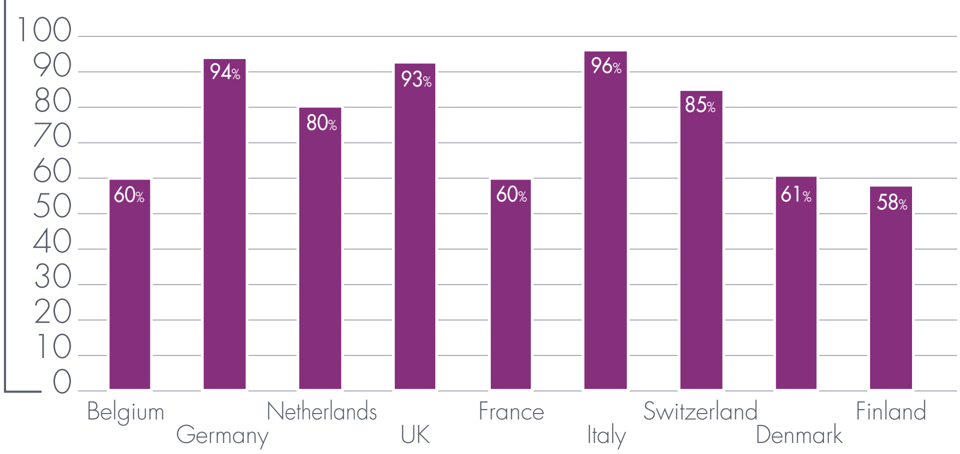
In spite of strong growth in the use of payment cards and the launch of new payment instruments ranging from pre-paid cards, to mobile payments to internet payment solutions, cash remains by far the most popular payment instrument. The European Payments Council estimates that there were approximately 360 billion cash transactions in the European Union in 2003, compared with 70 billion non-cash transactions. In other words, 85% of transactions are made in cash.

1 Cash in the economy

In the euro-zone, volumes of low-denomination notes have been increasing by a healthy 5% per annum, i.e. substantially more than inflation. This indicates that transaction demand is growing at a higher rate than GDP. As we head towards a service oriented economy, the number of transactions is continuing to increase. The market share of cash is however declining slowly.

A number of observers, from economists to payment service providers had expected that notes and coins would be replaced sooner by more technologically advanced payment instruments – cards, electronic purses, e-money. In spite of numerous innovations throughout the world, cash transactions have remained remarkably strong. Actually, it appears that in many cases new payment instruments have been competing amongst themselves rather than against cash.

3 Share of cash as a payment instrument



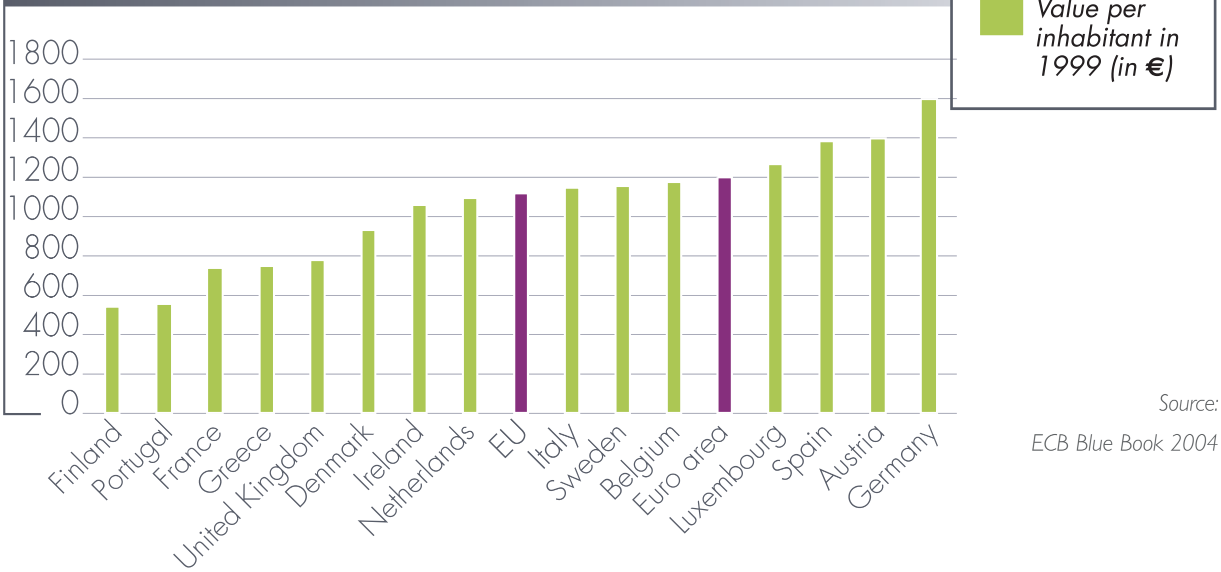
Source:

European Central Bank
Florida State University,
Bank of Finland "Substitution of Noncash Payment instruments for Cash in Europe" by Jussi Snellman, Jukka Vesala and David Humphrey - 1/2000

There are significant variations within the European Union

The usage of cash varies considerably from one country to another. Figure 4 shows that at the end of 1999, the value of cash in circulation varies from EUR 538 per person in Finland to EUR 1,597 in Germany. 1999 figures are used to avoid the distortion effect resulting from the euro cash changeover; during which hoarded currency was progressively returned from early 2000 (see fig. 2). One could expect cash usage to decrease in the European countries where it is the highest today, to converge towards the European average.

4 Banknotes and coins in circulation outside credit institutions

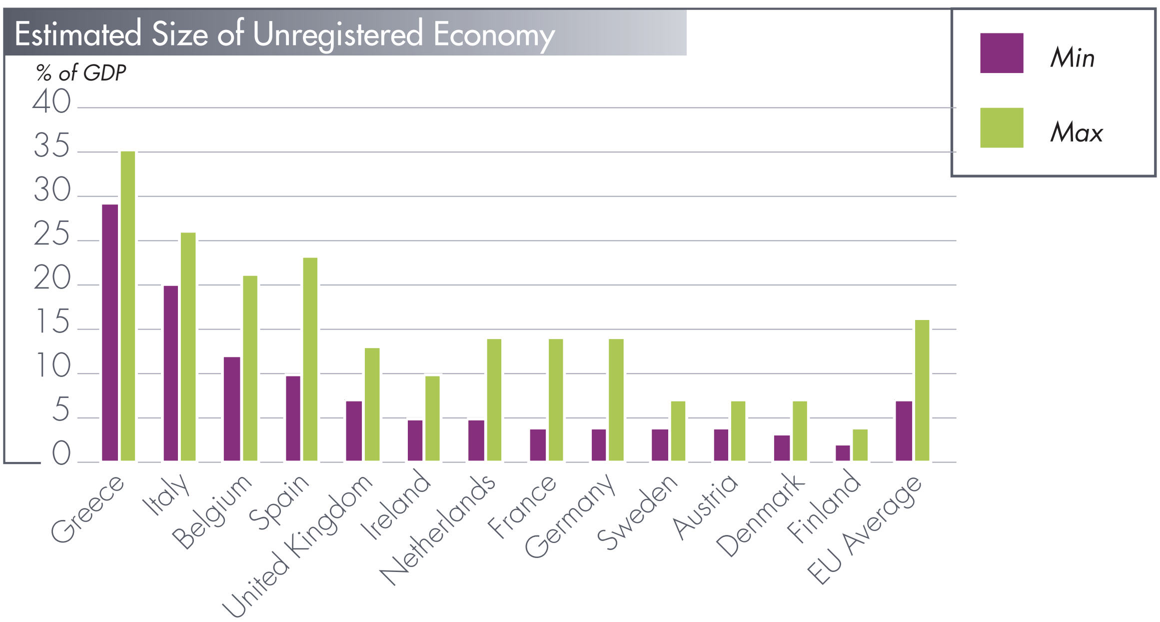


Source:
ECB Blue Book 2004

The volume of cash in the economy is influenced by the attitudes towards technology as well as the efficiency of other payment instruments. Finland for instance has developed a very efficient electronic payment system. Regulation may also impact cash holdings; in France payments by cash are restricted to transactions under EUR 3,000.

At the other end of the spectrum, the level of non-registered, "black market" economy has a positive influence on cash usage, as shown in figure 5. While cash is indeed used in the shadow economy, it does not create or even encourage it. There is a frequent confusion between the cause and the consequence.

5 Estimated Size of Unregistered Economy



European Comission 1998

Drivers for the use of cash

The three traditional drivers for the use of cash are anonymity, convenience and cost.

Anonymity is naturally one of the specific features of cash. Unlike any other payment instrument, cash leaves no trace. It is often said that as long as taxes, drugs and sex are around cash use will continue to grow.

However, anonymity also applies to those who are seeking legitimate privacy. This could become an increasingly important factor as banks, retailers and public authorities are developing sophisticated tracking systems for non-cash payment systems. Card issuers are adding loyalty applications to the chip cards; transit companies are looking at storing trip histories for frequent traveller discounts. The prospects appear quite daunting for those concerned about protecting the secrecy of their spending.

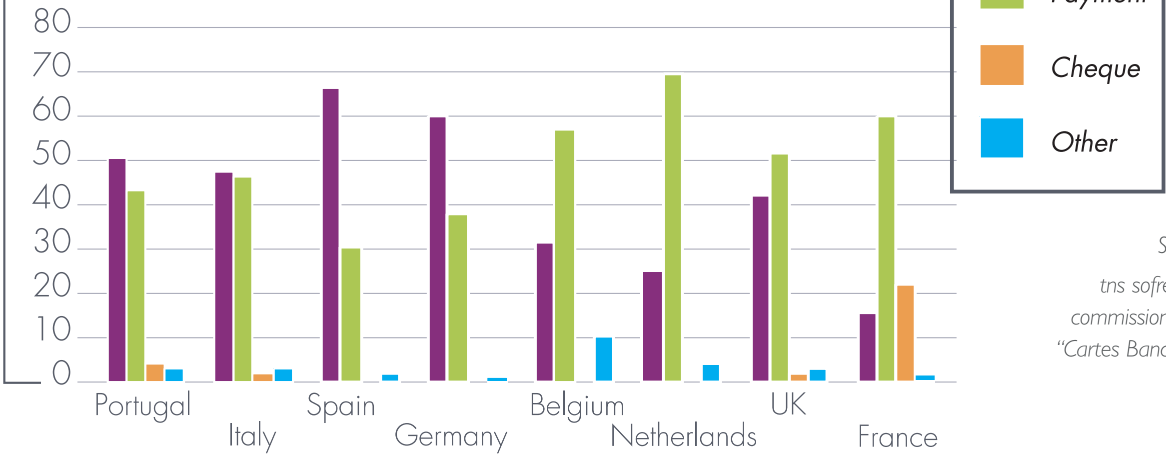
Convenience refers to a variety of features which include the universality of cash: cash is accepted – almost – everywhere. Another outstanding feature is transaction speed. Auchan the large French retailer has indicated that cash remains the fastest payment instrument at their tills with an average transaction time of 20 seconds versus 44 seconds for cards and 50 seconds for cheques. The Dutch National Forum[1] on Payment Systems has determined, on the basis of samples the following transaction times: cash 19 seconds, debit card 26 seconds, e-purse 14 seconds and credit card 28 seconds.

The cost of cash naturally depends at which point of the cash cycle you are located. However, for consumers cash is perceived as free. For the majority of retailers cash is also perceived as free since they do not calculate their internal handling costs.

Another driver is that cash has a magical aura for many consumers. The movies have represented this on numerous occasions with bundles of notes glowing in a suitcase or scattered on a bed like some aphrodisiac. According to a survey carried out by Alliance & Leicester in the United Kingdom in 2004, 15% of respondents believe they will use less cash in 5 years but 10% will expect to use more. Surprisingly, the younger people are more likely to think they will be using more cash with 27% of the 16-24 year-olds expecting to increase the amount of cash they use.

6 Preferred payment instrument

If you have the choice of payment method for what you are buying in the shops, how do you pay as a preference ?



Source: tns sofres poll commissioned by "Cartes Bancaires"

* *In Survey on the Costs Involved in POS Payment Products, National Forum on the Payments Systems, March 2004.*

Cash is an important contingency planning instrument. This is true at personal level, where consumers will carry emergency cash in case their card is rejected, lost or stolen. It is also at a collective level as central banks prepare for natural disasters or catastrophes. This was clearly demonstrated during the 2005 Katrina hurricane in New Orleans.

7 The pros and cons of cash

- Universal
- Requires no infrastructure
- Ease of use
- Anonymity
- Budget management instrument
- Well suited for peer to peer transactions
- Convenient
- Government-backed
- Contingency planning
- Immediate and final transaction

- Cost
- Non traceable
- Security
- Transport
- Ill-suited for non face to face payments
- Dirty
- Obsolete
- Facilitates tax evasion, underground activities
- Heavy

Threats to the continued use of cash

During the last 50 years, there has been a proliferation of payment instruments essentially developed by banks and aimed at displacing cash. Some have become widely accepted while others have yet to prove their capacity to capture a critical mass of payments flows.

The payment card, whether debit or credit has been particularly successful and has become a mainstream instrument. Card ownership in the EU now exceeds 1.5 cards per person and transaction levels average 90 per person per year, with significant differences between countries. Card usage however essentially concerns transactions above EUR 15. Below that amount cash is dominant and more economical, as has been demonstrated by both the Belgian and Dutch studies on the cost of payments (see following chapter The cost of cash).

1 Cash in the economy

Banks have been looking at ways of breaking this EUR 15 barrier. The e-purse was launched in most EU countries in the 90s. It aims at offering an instrument for low-value transactions which is cheaper for the merchant and faster as the transaction does not require an authorisation. Only a few schemes – Austria, Belgium, Netherlands and Luxembourg – have had relative success and the majority face an uncertain future.

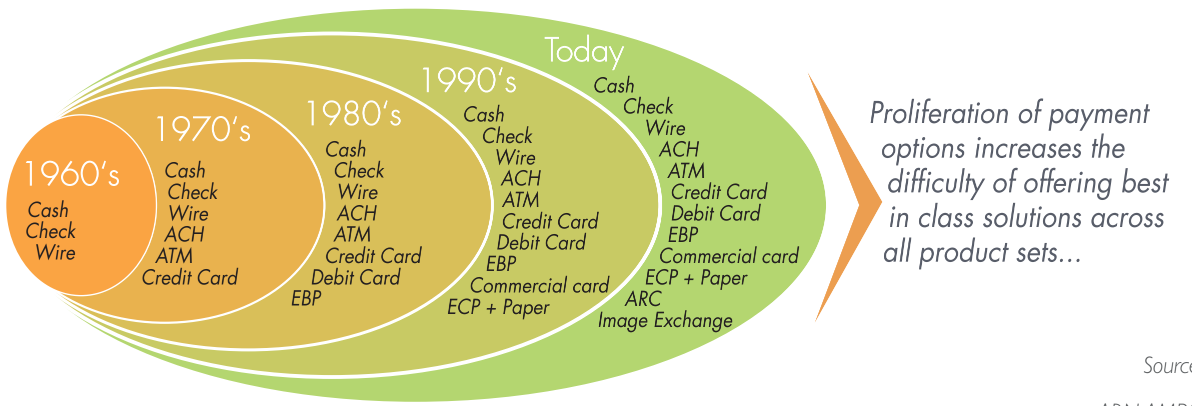
However, the ongoing migration to chip cards poses a new threat as the technology allows the combination of a debit card and a pre-authorised card on the same card. The cardholder allocates funds to the pre-authorised card upon request or this can be done automatically according to the card's parameters. At the point of sale, he chooses to use either the debit or the pre-authorised function. Banks and card schemes are planning rollouts of these cards in 2006.

Another technology which is targeting low-value cash transactions is the contactless card. The card communicates with a point of sale device and requires neither pin nor signature. The key advantage is that it considerably accelerates transaction time which leads to higher throughput at the till. The new EMV chip standard for payment card which is being rolled out throughout Europe enables to combine both contactless and pre-authorised features on the same card.

Hong-Kong is a world leader in the use of contactless card with its Octopus transit card. The card was initially launched in 1997 to allow commuters to travel across six public transport systems using one single card, thereby eliminating the hassle of finding exact change for individual journeys. In 2000 it was authorised by the monetary authority to expand its use. Today, Octopus can be used in almost all Hong Kong's transportation systems and also retail outlets, self-service businesses, leisure facilities, schools, parking and access control. The Wall Street Journal wrote in 2002: "Will Octopus Smart Card Make Hong Kong a Cashless Society? Hong Kong isn't known for being the center of technological innovation but it could very well become the first cashless society in the world, thanks to a little plastic card known as the Octopus."

The proliferation of new devices – which are often influenced more by marketing trends and technological innovation, rather than profitable business models – is forcing banks to invest in a range of new technologies, while the margins of existing payment instruments are under pressure.

8 The proliferation of payment instruments



Source: ABN AMRO

A second threat to cash is that it is often associated with a negative image. Cash is considered as old-fashioned and is regularly associated with sex, drugs and tax evasion. Most people are unaware of its importance as a payments instrument and consider it as obsolete. This image is further aggravated by the communication of all those who have a vested interest in displacing cash - card schemes, banks, transaction processors etc… - who clearly target cash as the enemy. MasterCard consider they are involved in "war against cash". Meanwhile, Central Banks who issue banknotes have a neutral position in respect to payment instruments.

The result is that cash is perceived as inefficient and little has been done to change this. Many players simply do not consider that cash can actually create value. Banks treat cash as a cost centre and very few banks have appointed a person in charge of cash at a global level; very little has been done to consider how to use cash to generate revenue or business. Also, the organisation of the supply chain has been overlooked and is often inefficient.

A third threat comes from government regulations. Governments have added new laws making it harder and harder to make payments in cash. Security, anti-terrorism financing and money-laundering concerns have led public authorities to make it increasingly difficult to deposit a suitcase of cash at a bank. In France, transactions of more then EUR 3,000 are prohibited in cash. In Germany, the sale of cigarettes from vending machines requires age-verification which is provided by the new chips on debit cards.

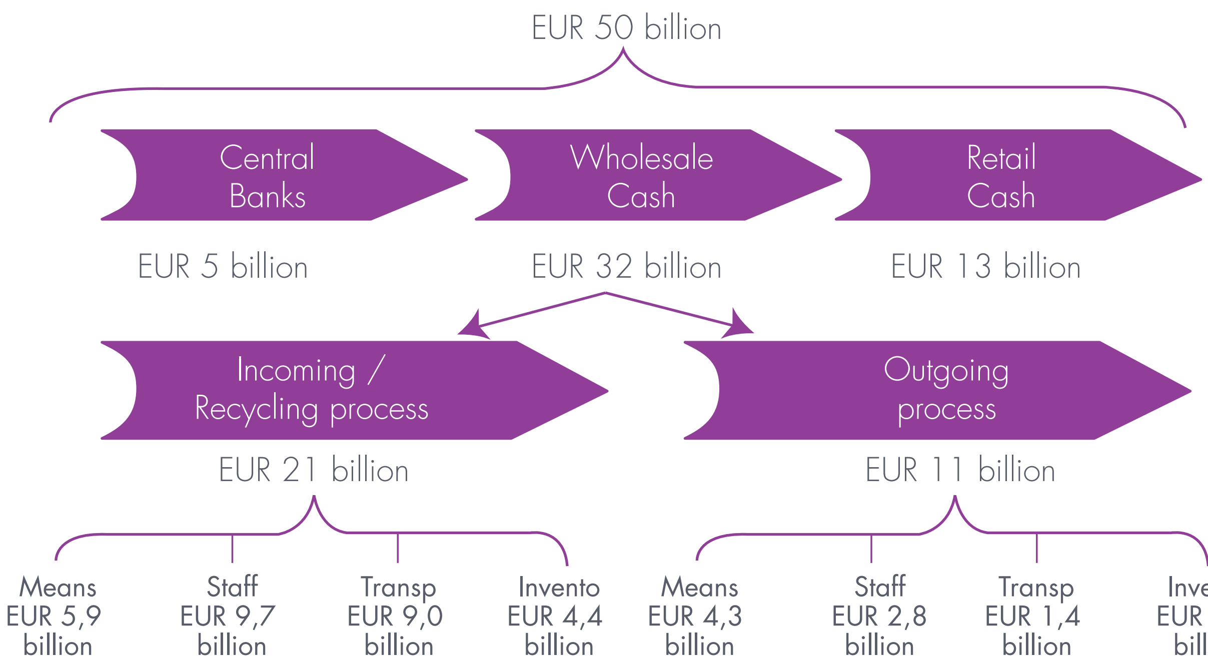
The cost of cash

The cost of cash is naturally a significant issue for the banking industry. Banks incur sizeable costs because they are both ends of the cash cycle. These costs have largely contributed to the development of the payments industry.

The European Payments Council has estimated the cost of cash at no less than EUR 50 billion for the European Union i.e. 0.4 to 0.6% of GDP. 65% of the total cost, i.e. EUR 32 billion is borne by the banking industry. These figures are in line with the findings of the Dutch National Forum on the Payment Systems, which estimates that the overall social costs involved in making cash payments ran to 0.47% of GDP.

9 The cost of cash to society

Source: EPC



In France, the overall cost of cash for a bank branch is estimated to range from € 25,000 to € 73,000. This represents a cost of approximately € 100 million for a large bank. In Germany, the total costs incurred by the credit industry for the supply supplying cash at some 50,000 bank branches in Germany average € 130,000 per branch, i.e. a total cost of € 6.5 billion per year for the banking industry.

The survey of the Dutch National Forum on the Payments System further concludes that when comparing cash to other payments instruments, the electronic purse is the most economical, whatever the transaction amount; cash is more economical than debit cards for amounts lower than €11.63 while debit cards are more economical for higher amounts.

The Central Bank of Belgium has also published an authoritative study on the cost of payments. It estimates that the overall cost of payments for Belgium amount to 0.74% of GDP while cash costs represent 0.58% of GDP. The study concludes that should there be a displacement of cash transactions by 25% towards debit cards and pre-paid cards, this would result in savings of 0.02% of GDP. Hence, only a full migration towards a cashless society would generate substantial savings but this is considered a purely hypothetical.

Another element to take into account when looking at the societal cost of cash is seigniorage, i.e. the net revenue derived from the issuing of currency. It arises from the difference between the face value of a coin or bank note and the cost of producing and distributing it. Seigniorage is an important source of revenue for the EU as it currently estimated at around € 16 billion.

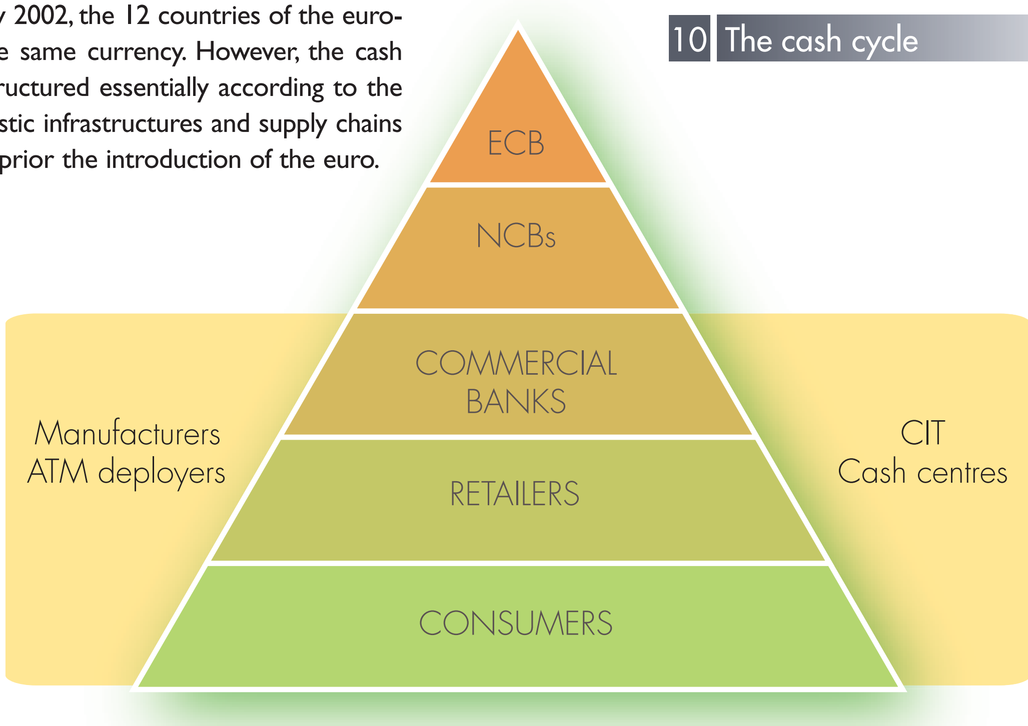
The key aspect however when looking at the cost of cash from a banking perspective, is that in the vast majority of cases banks are unable to generate revenue through the delivery of cash services. For various cultural, regulatory and commercial reasons, banks are unable to pass on the cost of cash to the end users.

This situation is evolving slowly however as banks are increasingly applying cash handling charges, particularly in the United Kingdom.

2 The evolution of the cash cycle

Since 1 January 2002, the 12 countries of the euro-zone share the same currency. However, the cash cycle is still structured essentially according to the multiple domestic infrastructures and supply chains which existed prior the introduction of the euro.

10 The cash cycle



At the top of the cycle, the European Central Bank's task as defined by the Treaty establishing the European Union consists in promoting the smooth operation of the payments systems. As far as cash is concerned, the ECB has the exclusive right to authorize the issuance of banknotes within the euro area. The Eurosystem, i.e. the ECB and the 12 National Central Banks have a neutral view of payments. In practice, only the national central banks physically issue and withdraw euro banknotes (as well as coins). The ECB does not have a cash office and is not involved in any cash operations. The legal issuers of euro coins are the participating countries. At the euro area level, the European Commission coordinates all coin matters.

The organization of the cash cycle remains the sole responsibility of the National Central Banks and there is no intention to design a one-size-fits-all policy. Indeed, numerous considerations need to be taken into account including security which poses different challenges in different countries.

The ECB has however made significant progress towards establishing a level playing field between the national central banks. Amongst the key measures taken to harmonize the European marketplace are:

- **March 2002:** common fee policy for cash services at NCB counters;
- **March 2002:** common approach to opening hours a NCB counters and debiting and crediting rules;
- **April 2002:** terms of reference for the use of cash-recycling machines;
- **December 2004:** framework for the recycling of cash by credit institutions;
- **December 2004:** high-level principles as regards NCBs' core functions in the distribution and recycling of cash.

2 The evolution of the cash cycle

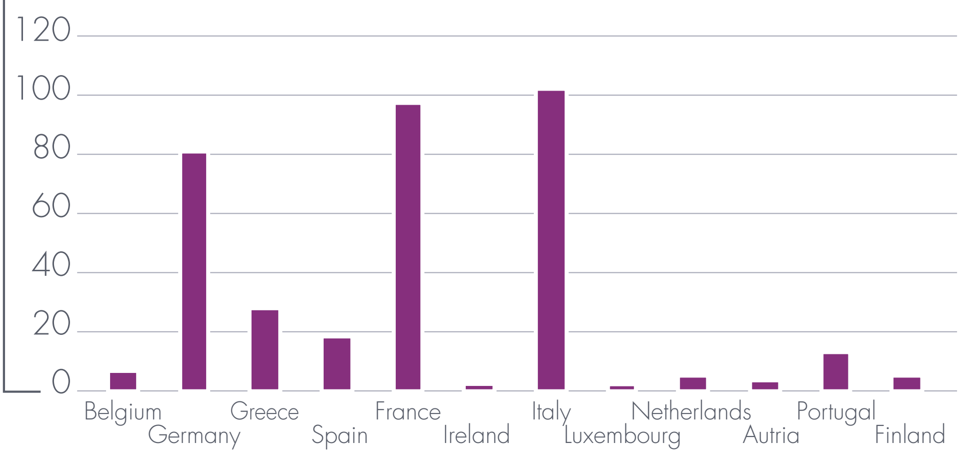
Different Central Bank models are emerging

The role of Central Banks in the cash cycle has undergone a fundamental transformation over the past few decades. Traditionally, Central Banks are responsible for safeguarding the currency in circulation. This includes providing the economy with cash, ensuring banknotes are counterfeit-free and the withdrawal of notes which are unfit for circulation.

For a long time cash was processed manually. In the eighties, Central banks moved towards semi-automatic processing systems. In the late nineties, automatic machines with higher throughput speeds were deployed. Increasing automation and reducing the number of processing stages also led to significant staffing economies and therefore cost savings.

The introduction of the euro facilitated the comparison of Central Bank services and costs in the euro zone. Following this Central Banks have been reconsidering their role in cash operations. To what extent does the Central Bank need to be involved in the cash cycle? What tasks are required to maintain a counterfeit-free currency, which is fit for market requirements? In parallel, considerations of cost efficiency have become the focus of attention for almost all Central Banks and it has become increasingly necessary to look at the services provided in terms of cost effectiveness.

11 Number of central bank branches



Source: European Central Bank

In the euro-zone three distinct models are emerging:

➤ The centralized model: the central bank continues to play a dominant role in the cash supply and maintains a dense network of branches.

Typically, the Bundesbank has reviewed its branch network and has decided to close 34 small branches and reduce the number of large branches from 65 to 47 by 2007. Simultaneously, the larger branches will concentrate on the most efficient processing systems and will extend their operating hours.

➤ The Notes Held to Order Scheme (NHTO): the commercial banks are allowed to hold banknotes at their cash centres off balance sheet; banks report their NHTO balances to the central bank and receive value-dating on their central bank accounts.

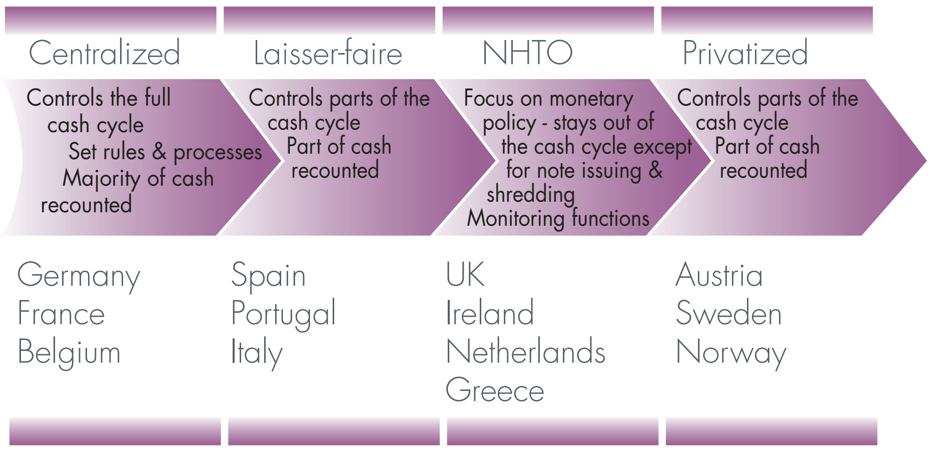
NHTO schemes can range from complete transfer of the processing to the commercial banks to a partial transfer. In the Netherlands, the Central Bank intends to continue processing approximately 30-40 of the banknotes in circulation.

➤ The utility model consists in establishing a joint-venture between the central bank and the commercial bank, which deals with wholesale cash processing i.e. issuing of new cash, destruction of unfit notes, fitness sorting, storage and distribution.

In Austria, GSA is the leading cash-handling company. The Central Bank owns 93% of the shares; the balance is owned by some 42 Austrian commercial banks. GSA is committed to providing efficient currency management services and logistical and technical support using co-sourcing agreements. GSA offers centralized clearing of Austrian banknotes and coins, foreign currency and travel checks for banks as well as cash services for business accounts at high security processing sites.

A study in Austria had shown a savings potential of up to 35%. The Central Bank remains responsible for the issuance of banknotes, detection of counterfeits, destruction of notes and acts as a majority stakeholder.

12 The evolution of Central Bank models



The recirculation of cash

In January 2005, the European Central Bank adopted a common framework on the recycling of euro banknotes. It enables banks and professional cash handlers to recirculate notes on condition that they have been checked for authenticity and fitness, using machines and processes which have been controlled by the Central Bank. This framework follows the Terms of Reference for the use of Cash Recycling Machines (CRMs) adopted in May 2002.

National Central Banks are responsible for implementing the framework within their national boundaries. A transitional period of two years, ending on 1 January 2007 provides for the adaptation of existing machines. Depending on the Central Banks, the framework is implemented through legislation, such as in France or through contractual arrangements such as in Belgium, the Netherlands or Austria.

The guiding principle of the framework is that banknotes which are re-issued to the public must be checked for authenticity and fitness by tested machines or trained staff. Only fit banknotes can be recycled; unfit banknotes are to be returned to NCB's.

2 The evolution of the cash cycle

ATM notes must be checked for authenticity and fitness by tested machines. There is an exception for remote branches which can continue manual fitness checking within a limit of 5% of the overall volume of banknotes recycled.

Banknotes which are checked for authenticity by trained staff can be re-issued over the counter after being checked for fitness

Counterfeits and suspect notes are to be handed over to national authorities

Machines used for recycling purposes are to be tested by an NCBs before their putting into operation (initial verification test). Successfully tested machines are published on the ECB Internet website. NCBs may carry out inspections at credit institutions/ Professional cash handlers on site to check the machines and banknote handling procedures. NCBs will collect statistical information from banks and professional cash handlers.

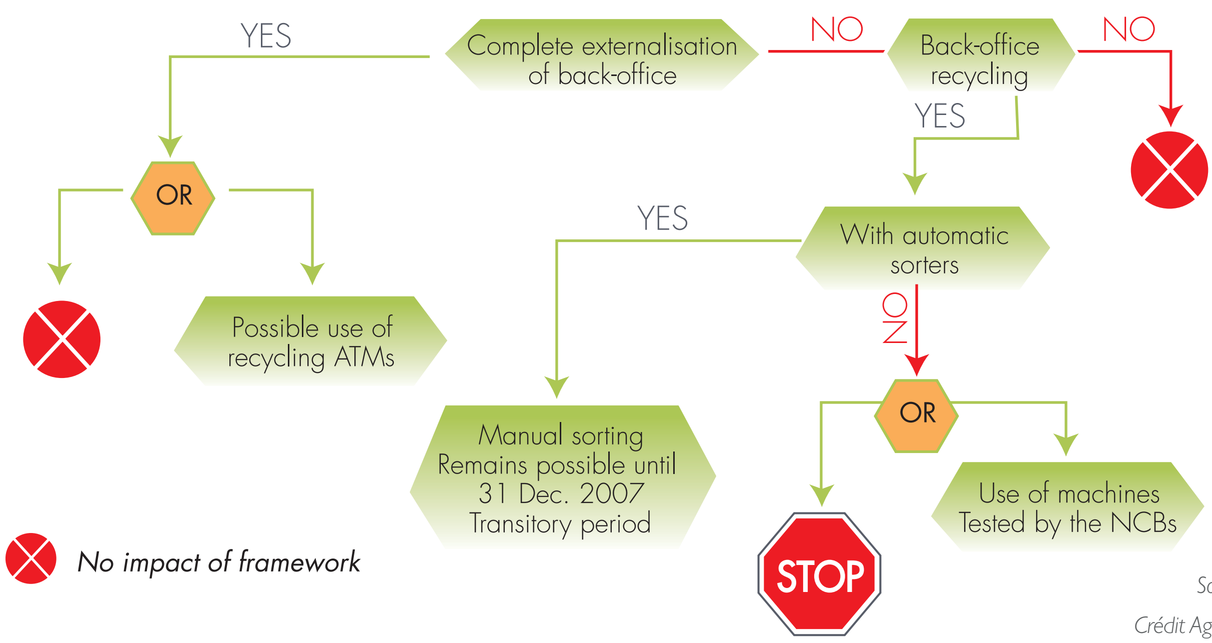
Recycling is expected to have an impact in the following areas:

- Cash centres will need to deploy the adequate equipment and ensure its maintenance;
- Savings are anticipated in terms of transport and insurance;
- From the society point of view, recycling should reduce the cost of cash by avoiding the duplication of tasks;
- For the banking sector, recycling will represent additional work;
- In the short term, additional investments will be required;
- For the banking industry, this could modify the competitive landscape.

Recycling will likely act as a catalyst towards existing trends as it will reduce the involvement of the Central Banks in the handling of cash, increase the automation of processing, and increase the workload for the private sector.

One of the key questions, however, is whether recycling will take place at the bank branch or at the cash centre. Advocates of branch recycling argue it would contribute to further shorten the cash cycle. However, it would require a balance between incoming and outgoing flows, in value and per denomination. On the other hand, this would require re-insourcing processing at the branch while the majority of banks have been striving to withdraw cash from the branches.

13 Front-office or back-office recycling



Source: Crédit Agricole

In any case, recycling will require significant investments to acquire new equipment to count and sort the notes and also for the reorganisation of processes. These investments will not happen overnight and these changes are likely to happen gradually. In the case of ATMs, this would happen during the replacement cycle of the installed base of machines.

Branch recycling

- Savings in cash logistics
- Optimisation of internal cash stock
- Minimize transport costs
- More flexible in servicing ATM-machines
- Investment in small tabletop sorters is enough to enable branch recirculation
- Savings primarily for small bank branches

Cash centre recycling

- Personal costs are higher in a branch
- Use of synergies and volumes
- Balancing of cash positive and cash negative customers
- Higher security
- Branches don't have to invest in new technology
- Branches do not need to introduce new processes

The Single Euro Payments Area

Although euro area citizens have been sharing the same banknotes and coins since 1 January 2002, the euro supply chain the euro area is characterised by the coexistence of multiple national infrastructures, based on different business models. In parallel, the European Commission and the European Central Bank do share a vision for a Single Euro Payments Area and encourage the banking industry and the other relevant stakeholders to create the technical conditions for its realisation by 2010.

SEPA does not directly cover cash; however, it does aim at improving the efficiency of cashless payments within the euro-zone and therefore fosters the use of these payment instruments as alternatives to cash. The European Payments Council (EPC) is the decision-making and coordination body of the European banking industry in relation to payments. Its purpose is to support and promote the creation of the Single Euro Payments Area (SEPA).

14 Guiding principles of SEPA

1 ➤ Consumers

Cardholders to be able to use debit cards SEPA - wide the same way as nationally today (e.g. costs, technical security, acceptance, fraud).

2 ➤ Service Providers

Equal market access and treatment to allow effective cross-border competition all along the value chain.

3 ➤ Infrastructure

Should support the Lisbon agenda - making European business more competitive via cost reduction and increased productivity.

2 The evolution of the cash cycle

For banks, the key challenge of SEPA is the convergence of payment card revenue towards the level of the most efficient European country. Capgemini has estimated the potential loss of revenue from payments revenue at between EUR 13 and 29 billion per year by 2010 ! To compensate for this drop of income, many experts are recommending strategies to displace cash transactions to the benefit of electronic payments.

This situation has evolved into a war between cards and cash. International card schemes are to a large extent leading the battle and positioning their debit solutions as SEPA compliant alternatives to cash. The replacement of cash by cards is perfectly acceptable from a societal perspective but it has o be done for the right reasons, i.e. improved efficiency rather than to the benefit of specific stakeholders. Ultimately it is the consumer who chooses which payment instrument for each transaction.

The Single Euro Cash Area (SECA)

The EPC is pushing for a further harmonisation of the cash supply chain. This includes:

- The possibility of cross- border Cash-In-Transit activity;
- The possibility for commercial banks to source cash from any Eurosystem bank;
- The removal of barriers against the pricing of cash and the possibility to discriminate between payment instruments.

In its plenary meeting of December 2004, the EPC adopted the following measures:

- "Educating retailers and consumers about cash-related security issues and costs generated by the use of cash, to increase awareness and lead to a more appropriate use of cash.
- Promoting electronic payments at points-of-sale, through joint cash/cards strategies including incentives for card usage, the promotion of pre-authorised debit instruments (e-money, e-purse, mobile payments,…), enlarging the possibilities for paying small amounts of money by card.
- Externalising the cost of cash to retailers and consumers to its actual users, in order to increase awareness of customers and limit the effects of economic distortion on other payment instruments.
- Encouraging governments to phase out cash disbursements use and accept and use electronic means such as credit transfers, direct debits, electronic money.
- Shortening the cash processing chain, through a reduction of the number of participants in the processing and distribution chain.
- Developing cash recycling at branch/ATM level, in order to achieve a substantial reduction of transportation/handling costs and improve public security and providing a better cash service to customers.
- Developing cash management to optimise cash flows, e.g. via the centralisation of cash ordering procedures for all outlets and the production of cash order predictions.
- Optimising ATM performance, through the use of performance evaluation software aimed at identifying the best denominational mix and replenishment frequency, the use of a fault monitoring system, centralising the branch ATM estate and automating the balancing and reconciliation ATM system.
- Outsourcing cash processing to common infrastructures to allow achieving economies of scale and reducing costs.
- Optimising teller operations, including increasing the number of functionalities of automated teller machines, the use of shared tills, and a weekly balancing of tills, or inclusion of merchants in the process chain."

3 The organisation of cash within the bank

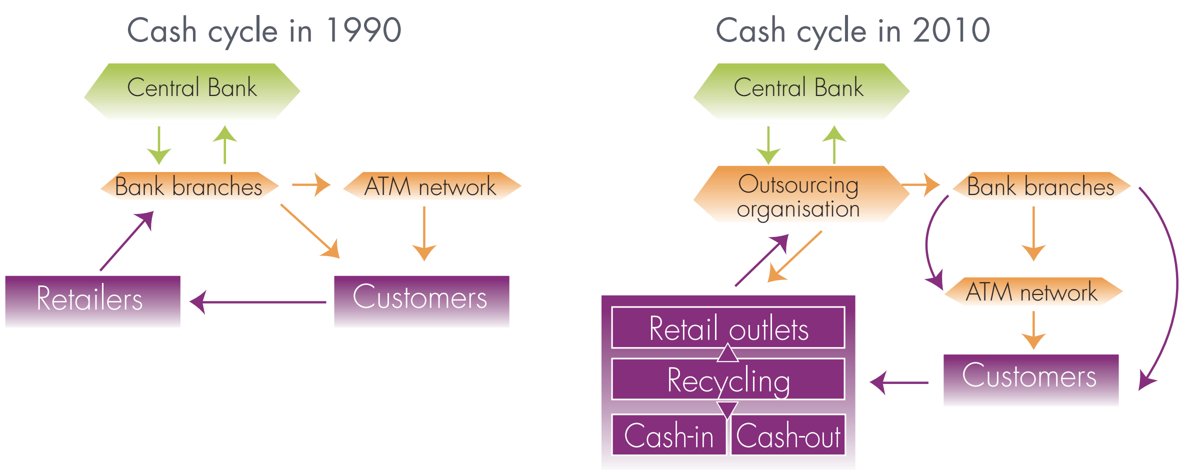
Banks have deployed different models for managing cash, some of which are quite complex particularly in the large financial institutions. The management and supervision of cash within commercial banks covers many areas – security, money-laundering, legal, payments, branches, ATMs… The majority of the banks interviewed for this research mentioned have not appointed a Head of Cash to co-ordinate and oversee cash-related activities throughout the organisation. In most cases, the responsibility for cash is diluted throughout the organisation.

This poses significant challenges to the banks, both for the running of cash as a business as well as for the precise identification of the costs and revenue associated to cash.

The situation seems however to be improving slowly. The euro cash changeover certainly contributed to emphasize the structural importance of cash for the banks; the growth of cash usage since 1 January 2000 has provided a further incentive to reconsider the organisation of cash within the bank.

The trend towards outsourced processing

15 The evolution of the cash cycle



Throughout Europe, the vast majority of banks are opting for the outsourcing of wholesale cash processing. A number of factors explain this.

Cash processing is an industrial process and very far away from traditional banking activities and culture. Bank staff often have a negative perception towards cash. The internal organisation of cash handling are often obsolete and inefficient, inherited from old bank organisations and further complicated by mergers, acquisitions and restructuring.

In order to offer their clients best-in-class services, banks would be required to make significant investments in information technology and cash handling equipment. Central banks have increased their demands in terms of statistics and reporting.

3 The organisation of cash within the bank

Cash processing is becoming increasingly capital intensive

Traditionally, cash processing is a labour intensive activity. The development of automatic processing systems has made it possible to achieve a significant rationalisation effect. Central Banks are now implementing multi-denomination processing. These systems are being increasingly used by private cash handlers.

As banks have been outsourcing the processing to CITs they have been increasingly improving the productivity through automation and economies of scale. Cash centres are now being redesigned along the lines of highly efficient industrial assembly lines. Individual workstations are being phased out and processes redesigned so as to reduce manual intervention. Straight-Through Processing is being implemented

However, the information streams have not evolved as fast as the physical processing and it appears that there are significant opportunities for efficiency improvements and savings to be achieved through the reconfiguration of information systems. Most cash handlers are still far away from a seamless integration with the banks' information systems.

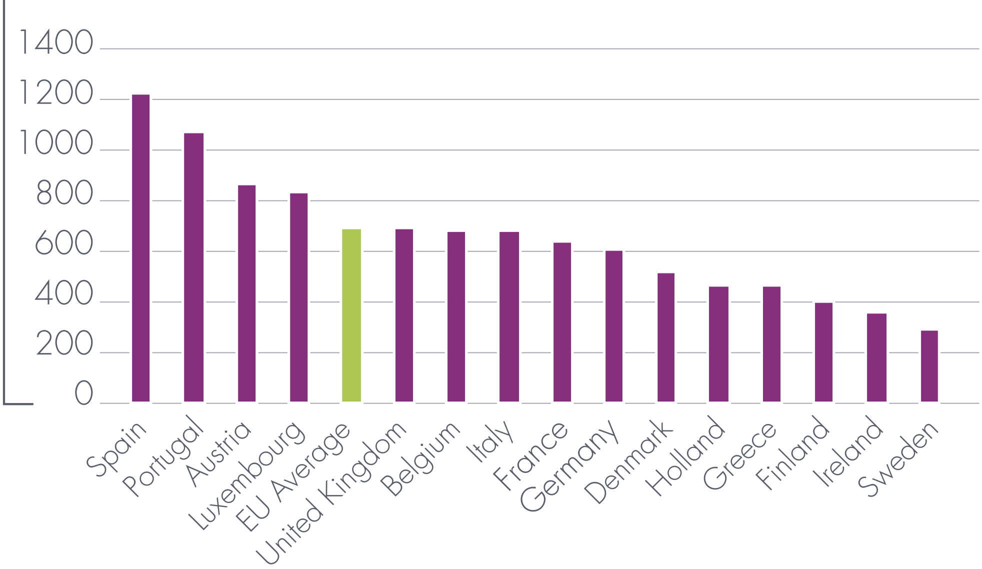
The automation of retail distribution

Automatic Teller Machines now represent the most important channel for the distribution of banknotes to the general public. In the United Kingdom, the Association for Payment Clearing Services – APACS – estimates that 51% of cash was distributed through ATMs in 2002 and forecasts this figure to grow to 74% in 2012. They have undeniably become the most frequent contact point between the bank and its customers.

ATMs have radically improved the convenience of cash for the customer by offering 24/7 access to cash at a very large number of locations (see fig. 16). They have contributed to transform the efficiency and the productivity of the branch bank and have significantly improved security and facilitated the development of a more open environment.

Further, the expansion of ATM networks has enhanced the convenience of cash and reduced potential interest rate losses by increasing accessibility to cash closer to point of sale. This has historically for the first time reduced the costs of cash use in payments.

16 ATMs per million inhabitants 2003

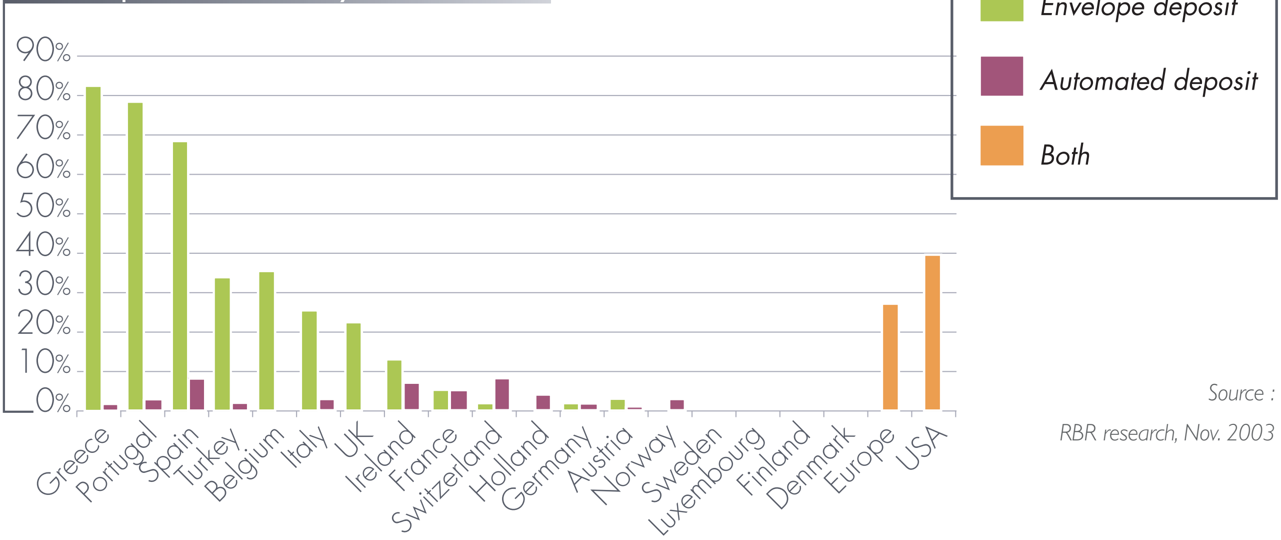


Source: ECB blue book 2004

While ATMs have established themselves as the primary source of cash, branches are still mostly used for deposits. In Japan, 80% of the ATMs incorporate a deposit facility, versus 39% in the USA and 29% in Europe. The European Payments Council estimates that the overall cost of deposits amount to EUR 21 billion.

In 2002, the European Central Bank issued terms of reference for the use of cash recycling ATMs within the euro zone. Many banks are currently testing recycling ATMs at pilot locations. However many banks are carefully analysing the profitability of recycling ATMs. The investment is significantly higher than traditional ATMs – around EUR 45,000 on average. To optimise the cost reduction in transport and filling, the in and outflows need to be balanced. Crédit Agricole has estimated that the breakeven point is reached at 5,500 withdrawals per month.

17 ATM deposit functionality 2002



Source : RBR research, Nov. 2003

The rollout of recycling ATMs will depend on the results of the ongoing pilots; many banks have adopted a wait-and-see attitude and have expressed concerns about the stability of the technology. Considering the investment, it is expected that the deployment will take place gradually as they replace their existing installed base of dispensers.

The development of smart deposit functionalities are in line with the move towards the cashless branch adopted by the vast majority of European banks. The concept consists in migrating cash transactions towards a self-service area, separated from the sales area. The primary objectives are to enhance the security of the branch, improve the cost-efficiency of cash handling and shift the focus of the branch towards sales. Rabobank in the Netherlands launched such a programme in the year 2000, when they still had about 50 million counter transactions. This means that a customer visits the branch ten times a year; the implementation has resulted in a decrease in the counter transactions from ten times a year per customer until today's level of one transaction per customer per year. Almost 98% of all cash transactions are already handled by the ATM.

Different deposit technologies – envelope deposit, automated deposit, recycling - provide an opportunity for differentiation. Indeed, different customers will likely opt for different types of deposit; e.g. for small deposits, the convenience of automated deposit might be preferred while the security of envelope deposit is more suitable for large amounts.

3 The organisation of cash within the bank

There is also room to improve the use of ATM channel for selling and marketing purposes. In countries such as Spain and Portugal, ATMs regularly offer a wide range of services from mobile phone top-ups to bill payments, bank transfers, cheque issuing as well as ticketing and advertising. There is a debate over the optimal range of services available: should the ATM be reserved for rapid cash dispensing or should it evolve into a multi-function distribution and communication channel?

Consolidation of the CIT industry

The Cash-in Transit industry includes three key segments:

- Transport: transportation of notes and coins either by armoured truck or using alternative transport systems
- Processing : sorting, counting, authentication and packaging as well as the corresponding reporting
- Management of ATM networks: replenishment of ATMs and first level maintenance.

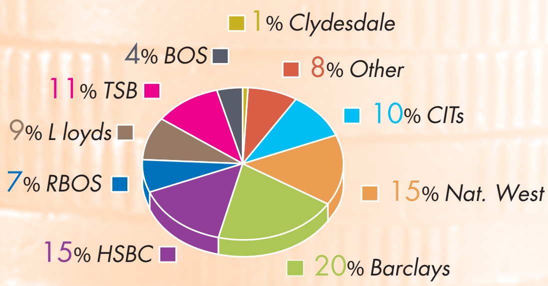
The major European CITs are offering the full range of these services, and sometimes beyond. In France, Brink's has entered a partnership with Diebold and are in a position to offer full ATM maintenance. CITs are also increasingly developing their services aimed at the retail environment and are developing and-to-end solutions for the management of cash, for retailers.

There is an opposition between countries which have undergone consolidation, such as in the United Kingdom or France and those which remain fragmented, such as Germany and Italy and where CITs have only started processing recently.

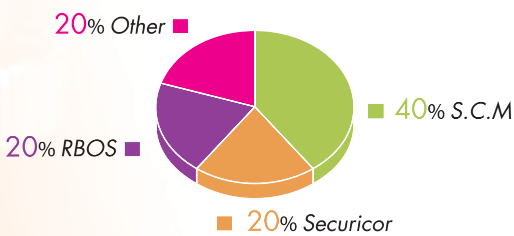
In the United Kingdom, Securitas has formed a new company, Securitas Cash Management. SCM founded in July 2001 as the result of a joint venture between the cash processing businesses of Securitas UK, HSBC and Barclays Banks. SCM now processes approx. 40% of all the UK's cash deposits and have plans to increase its share. SCM own 11 strategically located Cash Centres and 6 Coin Centres across the UK where it provides a fast and efficient processing service of bank notes and coin.

18

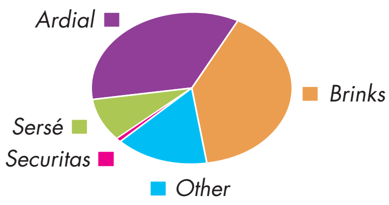
Bulk Cash Market Shares 1993



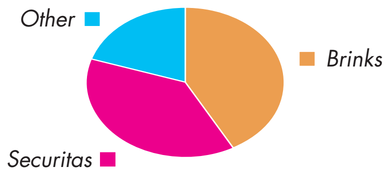
UK Bulk Cash Market 2003



The French CIT market 2000



The French CIT market 2004



In Germany the federal structure of the government and the Bundesbank has been replicated at the CIT level which explains the high number of local companies. Also, the number of banks in Germany is higher than the European average, with approximately 100 companies offering transport and processing services. However, the move towards consolidation has been initiated.

In February 2006, German's largest CIT firm, Heros filed for bankruptcy after suspicions of embezzling approximately EUR 300 million from its customers. The private company is being investigated by German police for using cash collected from its customers to fund its expansion. Heros had become a market leader in Germany with a market share estimated at 50% and had expanded into Belgium, the Netherlands and the Czech Republic. Its collapse had raised concerns regarding the supply of cash in Germany. Prior to the bankruptcy, industry insiders had suspected the company of price-dumping.

Italy seems again to be an exception as there are over 600 CIT companies, most of which operate on a regional basis and are only marginally involved in cash processing.

Currently the majority of commercial banks have outsourced their cash processing activities to C.I.T. organisations. There has been some consolidation which has reduced some costs.

The profitability of this business is only known to these organisations and when the contracts are due for renewal, all parties will need to review the benefits of continuing the contracts further.

The banks may wish to introduce productivity targets into contracts, whereas the cash processors may want to improve profitability to finance future capital investment.

Unless margins are improved, it is difficult to see the cash processors being able to invest sufficiently in new technology to significantly improve efficiency and ultimately drive down costs.

It would seem unlikely that the banks will want to take back this cash processing as they no longer see this as their core activity and have seen significant savings to date.

Consolidation has also resulted in the reduction of the number of cash centres, as processors have been concentrating on larger and more efficient centres. This raises logistical issues as it increases transport distances. The situation becomes more worrying as traffic congestion worsens.

3 The organisation of cash within the bank

Cash is central to retail banking

There is a consensus according to which banks cannot abandon the distribution of cash. Indeed the concept of converting cash into deposits was invented by the banking industry. For the majority of consumers, access to their money in form of cash remains a core element of the banking relationship. However, banks have been focusing their attention towards reducing the cost of cash; little attention has been paid to using cash to improve the overall delivery of banking services and as a factor of differentiation.

Cash justifies the existence of ATM networks. Banks have invested heavily in these networks over the past decade. While some machines offer new functionalities such as mobile telephone top-ups, ticketing, advertising… cash withdrawals continue to represent the bulk of the revenue derived from ATMs. ATMs have now become an important distribution channel for the banks and in many cases a profit centre.

In the United Kingdom, there are 20,000 fee-charging ATMs which have collected £ 140 million in fee revenue in 2003, an increase of 133% on the previous year according to data compiled by Nationwide

Typically, banks draw a third of their revenue and a significant share of their profits from payments. And notes and coins remain the most prominent payment instrument. Currency is often regarded as competition to other payment instruments but actually it is a natural complement. The average consumer does not use cash or a card but uses cash and a card, and possibly cheques, transfers, etc…In many cases, the card is actually used to withdraw cash. The revenue resulting from these transactions should be charged to a cash P & L.

Cash offers the unique opportunity for banks to meet their clients. In the eighties, with the development of branch automation a number of banks moved towards a "cashless branch" concept by separating the sales area from the ATMs. Some banks however are reconsidering their position, as moving cash out of the branch has led to fewer customers visiting the branches.

Niche players have been increasingly penetrating the payments business: credit card issuers, telecom operators, retailers, pure internet players… Banks have one key competitive advantage is that they can offer their customers the whole range of instruments they require, including cash.

New entrants

It is interesting to draw a parallel between the value chains of cash and other payment instruments. Take cards for example, over the years there has been an increasing unbundling and specialisation of the card value chain which has favoured the emergence of new players in the industry, e.g. third party transaction processors, monoline card issuers…

As banks have been increasingly outsourcing cash processing, new entrants are also being attracted to the cash supply market or existing players are reviewing their position in the value chain. The arrival of new players could well contribute to instigate new blood into the marketplace.

Giesecke & Devrient

German manufacturer of cash-handling equipment has entered the cash processing business and offers comprehensive cash outsourcing to commercial banks, central banks, cash-in-transit companies… Giesecke & Devrient have signed a long-term contracts with Commerzbank which provides for the supply and disposal of cash at branches and ATMs, and controlling the cash logistics by two cash centres. Two CIT companies have been commissioned to ensure transport.

Similar arrangements have been signed with HVB in Germany, the Central bank of Morocco as well as with the authorities of Dubai and Bahrain.

CPR Billets

CPR Billets is the leading wholesale operator of foreign banknotes in France. It provides banks and various financial institutions with foreign currency for their own customers.

Following the introduction of the euro, in the context of its diversification strategy, CPR Billets extended its services to the management of euro cash centres and has brought its expertise in terms of workflow rationalisation and the handling of banknotes to the processing of the euro.

ISOs – IADs

Independent ATM Deployers – also called Independent Service Operators - are another example of new entrants in the cash supply chain. The model is imported from the USA, and is a striking counterexample to the perception that consumers refuse to pay for cash. The business model is based of a surcharging or withdrawal fee paid by the consumer. Almost half of UK's 55,000 cash dispensers are owned and operated by ISOs, which supply over half of all cash to individuals in the UK. ISOs are well implanted in the UK and are expanding ito the Netherlands, Germany and Eastern Europe.

Cashferium

Cashferium is a privately-owned Dutch company which has developed an innovative concept called the Secure Local Cash Centre – SLCC. The SCLC will be installed within shopping malls and commercial areas and will include several ATMs and a cash-deposit unit for ATMs. Thanks to local recycling the Casferium aims to reduce the cost of cash for retailers by 60%. The company is piloting its first unit the Netherlands in May 2006 and has ambitious plans for its European development.

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