

# Cash

## Essentials

Beyond Payments



# Preface

Every day, billions of banknotes and coins change hands, enabling all kinds of transactions to be carried out. The role of cash as a payment instrument is well known and volumes of economic literature deal with the resilience of cash, its efficiency compared to non-cash payments and the role of cash amid alternative payment instruments. Undeniably, cash continues to play an important, often dominant role in retail payments.

However, cash has numerous other attributes beyond payments. Children solve their first algorithm problems by counting coins. In times of economic hardship, many consumers rely on cash to manage their budgets more carefully. For many countries, banknotes reflect their national heritage and values. When natural or man-made disasters strike, cash is often the fall-back solution.

The objective of this white paper is to identify the unique attributes of cash and understand how they contribute to the demand for cash. Cash faces ever-increasing competition from alternative payment instruments, ranging from debit and credit cards to credit transfers and direct debits, as well as emerging payment instruments such as electronic and mobile payments and even virtual currencies. All these instruments challenge the payment function of cash. Despite this disruptive evolution, the demand for banknotes and coins has continued to grow at a significant pace around the world.

This white paper could not have been done without the insight, expertise and guidance of:

- Antti Heinonen, Former Director of Banknotes at the European Central Bank and Chairman of the Banknote Ethics Initiative;
- Lahcen Hadouni, Former Director of Dar-As-Sikkah, printers for the Central Bank of Morocco;
- Dan Littman, Senior Payments Research Consultant, Federal Reserve Bank of Cleveland, the US.

I would like to express my warm gratitude for their invaluable contribution. My thanks also go to SICPA for sponsoring this paper.

Guillaume Lepecq,  
founder of AGIS Consulting



To Lucy and Elisa

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**Cash possesses unique attributes, which are mostly unmatched by alternative payment instruments. Cash also generates benefits for society that are not directly linked to its payments function.**



# Executive summary

Payments have seen significant diversification in recent decades, with the emergence of new instruments, new players, and new operating models. One key driver has been the introduction of new technologies which have created new channels and new business models for transactions. The payments industry has adapted to this evolution by developing a range of new solutions. However, cash continues to play an essential role, as illustrated by the constant global growth in banknote volumes.

One explanation for this growth is that cash possesses unique attributes, which are mostly unmatched by alternative payment instruments. Cash also generates benefits for society that are not directly linked to its payments function. These features can be summarised by four core characteristics.

**Cash is universal.** Cash can be used by all and accepted by all. It does not require a bank account or a device by either party to a transaction. It does not depend on a telecommunications network. Whereas alternative payment instruments are increasingly specialised and dedicated to a specific type of transaction, cash is used for a broad range of transactions, in terms of value, the channels employed, and the interacting parties: person-to person, person-to-business, person-to-machine etc. It has demonstrated a remarkable capacity to adapt to new transaction opportunities, such as e-commerce, where cash is used, for example by paying ‘cash-on-delivery’ for goods ordered on the internet. Cash is particularly suited to the more fragile segments of society, including small stores and individual businesses; the “unbanked”, which represent half of the world’s population; the blind and visually impaired.

**Cash generates trust.** Cash is recognised as a secure payment instrument as evidenced by extremely low levels of counterfeiting, in relation to the volume of notes in circulation. This is largely because banknotes rely on state-of-the-art technology to defeat the counterfeiters. But more importantly, with the exponential growth in data breaches and rising crimes of identity theft, cash provides a solution to protect personal information and privacy. Cash also plays an essential contingency role; many consumers carry some banknotes in case other

payment instruments are not accepted or equipment is out of service. At a national level, in the event of natural or man-made disasters, cash is often the only available form of money and ensures that the economy can continue to operate.

**Cash is efficient.** Globally, cash is the most widely used payment instrument. Its efficiency compared to other payment instruments depends on the country and the methodology used, but it is the most efficient for low-value payments which represent the bulk of all transactions. Innovation has improved the efficiency of cash; banknotes are increasingly secure and durable; technology has facilitated the automation of cash handling, and cash-management policies have accelerated the smooth flow of money within the economy. The market share of notes and coins makes them a benchmark and regulators attempt to ensure that non-cash payments achieve the same level of efficiency. Cash guarantees some competition between payment methods.

**Cash connects people.** Cash is probably the single most widely used product in the world. It contributes to a form of social cohesion; the same notes and coins are used by all, regardless of age, gender or class. Countries use notes to promote their heritage and values and the national currency is in many cases a symbol of sovereignty. All over the world, children learn to count and to read with banknotes and coins; they are an essential educational element in financial literacy.

It is particularly difficult to quantify the value of cash to society. How important is it for a country to have its name, national symbols and mottos printed on millions or billions of banknotes? How important is it for an economy to have an emergency monetary mechanism when a tornado, a technological breakdown or a financial crisis occurs? What would be the cost of developing a payment infrastructure for the billions of people who are excluded from the formal banking sector? It is essential for regulators and central banks to consider these questions when they develop payment and cash management policies.





1.

# Cash is universal

**Cash is available to all users.  
It covers a broad range of transactions.  
It does not require a technology  
infrastructure.**

**Cash has a legal tender status,  
and also serves as a store of value.**

1.1

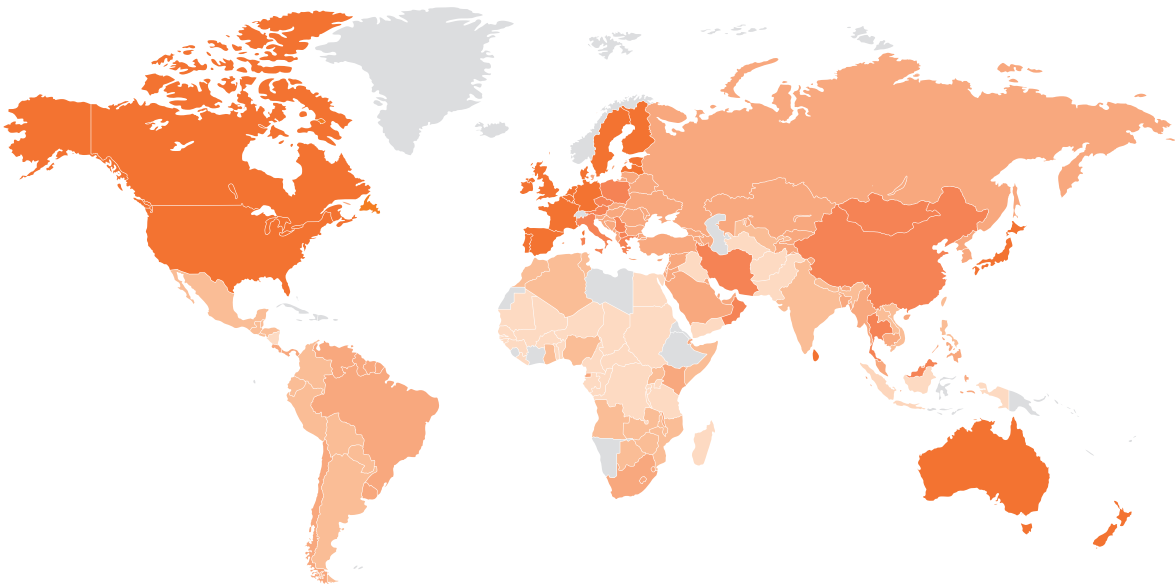
## Cash is available to all users

**Cash can be used by everyone, regardless of age, gender or financial situation. Because it is not linked to the identity of the users, cash does not discriminate against its users.**

One obvious feature of cash is that it can be used by all, regardless of age, gender or financial situation. In many cases, people do not have access to alternative instruments or to banking services in general. According to the World Bank<sup>1</sup>, only 50% of the world's population aged 15 years or older have an account at a formal financial institution. The majority of the “unbanked” live in developing countries, but even in the US 7.7% of households, amounting to 9.6 million house-

holds, had no account in a formal financial institution in 2013<sup>2</sup>. Children constitute another group with limited access to non-cash payments; according to the United Nations Population Estimates<sup>3</sup>, 27% of the world population was under 15 years old in 2011, representing 1.8 billion children.

*Share of population above 15 holding an account with a formal financial institution in 2011*



Indicator: Account at a formal financial institution (% age 15+)  
Year: 2011

no data   0-20.2   20.2-40.1   40.1-60.0   60.0-79.8   79.8-99.7

Source: Demircuc-Kunt and Klapper, June 2012



**Alongside the fact that it can be used by everyone, cash does not discriminate among users.**

Michael King<sup>4</sup> has established that in Nigeria, where only 30 % of the population above 15 is banked, the number of official documents required to open an account reduces the likelihood of being banked. According to UNICEF<sup>5</sup>, worldwide 230 million people under the age of five – around one in three – have never been formally registered and therefore do not officially exist.

There are numerous other groups which have limited or no access to alternative payment systems. In some countries, women are not entitled to open a bank account. For others, non-cash payment systems are challenging to use; particularly for vulnerable people such as the illiterate, the visually impaired, and persons with mental disabilities.

Cash can also be accepted by all merchants. It does not require a bank account, registration with a payment scheme, a device such as a POS terminal, or access to a network. As a result, the vast majority of merchants worldwide accept cash, whether they are large or small, including those in remote locations without access to phone, internet or electricity.

Politics can interfere with the acceptance of other payment methods. In 2010, Visa, MasterCard and PayPal blocked payments to WikiLeaks, a not-for-profit media organisation that had published US diplomatic cables and classified information. In 2014, following the annexation of Crimea, Visa and MasterCard stopped processing transactions for several Russian banks in line with US sanctions<sup>6</sup>.

Alongside the fact that it can be used by everyone, cash does not discriminate between users. Payment service providers tend to segment their markets according to income levels; the more affluent customers are offered premium solutions with an ever-increasing range of benefits and rewards. These products also become a status symbol. Mashreq Bank in the UAE has launched its exclusive Solitaire<sup>7</sup> credit card, with a certified diamond embedded in it. Those who do not have access to premium cards may feel ostracised.

Another illustration of discrimination concerns welfare organisations that attempt to replace cash payments with alternative instruments. In 2009, The British government introduced the Azure payment card for people who have been refused asylum. The card is only accepted at designated retailers and is intended to cover food and essential toiletries only. According to a study published by the Asylum Support Partnership Team<sup>8</sup>, “the payment card causes anxiety and distress amongst users and contributes to the stigmatisation of asylum seekers.” In particular, 56% report feelings of anxiety and shame when using the card and 38% report being ill-treated by shop staff.

1 <http://datatopics.worldbank.org/financialinclusion/home/>

2 <https://www.fdic.gov/householdsurvey/>

3 <http://esa.un.org/unpd/wpp/Excel-Data/population.htm>

4 <http://michaelking.ie/wp-content/uploads/2011/11/The-Unbanked-Four-Fifths-Barriers-to-Banking-Services-in-Nigeria-November-2011-Final.pdf>

5 [http://data.unicef.org/corecode/uploads/document6/uploaded\\_pdfs/corecode/Birth\\_Registration\\_lores\\_final\\_24.pdf](http://data.unicef.org/corecode/uploads/document6/uploaded_pdfs/corecode/Birth_Registration_lores_final_24.pdf)

6 <http://www.finextra.com/news/fullstory.aspx?newsitemid=26039>

7 <http://www.mashreqbank.com/uae/en/solitaire/home.aspx>

8 [http://www.refugeecouncil.org.uk/assets/0001/7057/ASP\\_-\\_azurecard-v4.pdf](http://www.refugeecouncil.org.uk/assets/0001/7057/ASP_-_azurecard-v4.pdf)

1.2

# Cash covers a broad range of transactions

**Cash can be used for a broad range of transactions of different value, via different channels and between different parties. It is a “general purpose” instrument.**

Retail payments are increasingly diverse, involving a growing number of variables: the value, the frequency, the actors involved (business, consumer, and administration), the spending category, the channel used, the device, etc. The result is a complex matrix of transaction types.

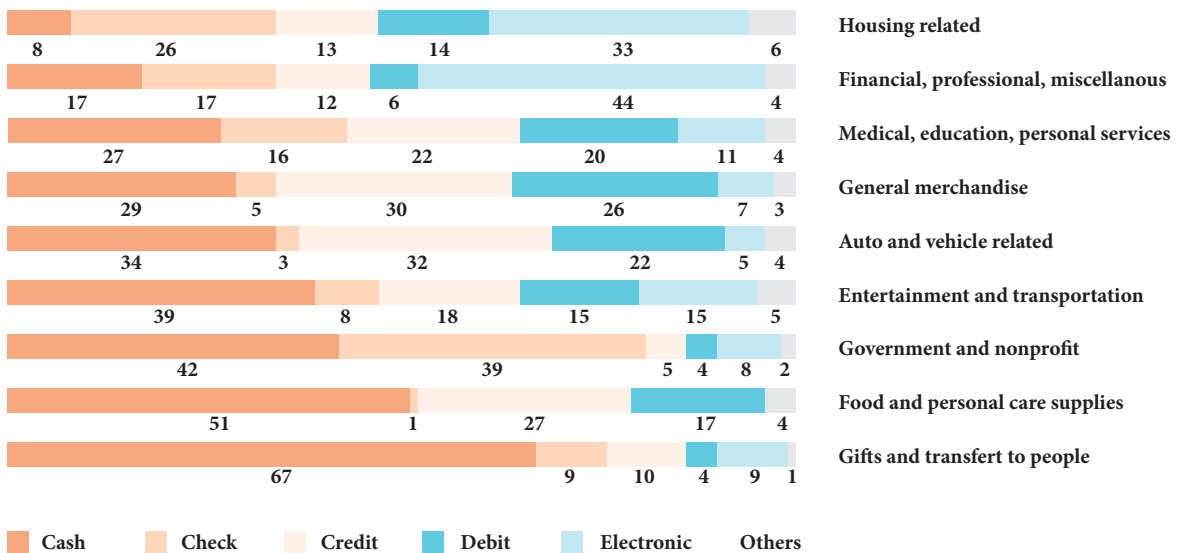
At the same time, payment instruments are growing increasingly specialised, dedicated to a specific channel such as online payments, a specific spending category such as travel, or a specific merchant. In London, the Oyster card has been introduced for electronic ticketing on public transport; it has been designed to reduce the use of paper tickets and phase out cash transactions. It is

a stored-value card which can be loaded online, at payment card terminals, or with cash. In June 2013, it was revealed that nearly £100 million of passengers’ money is lying on dormant cards<sup>9</sup>. Similarly, dollars loaded on Starbucks cards totalled \$1.4 billion in 2014<sup>10</sup>. Other instruments are used specifically for online payments or for peer-to-peer transactions.

Cash on the other hand can be used for a broad range of transactions. Numerous consumer payment surveys have shown that cash is widely used for low-value transactions. In the US, according to the 2012 Consumer Payments Diary<sup>11</sup> (see below), 66% of transactions under \$10 are settled in cash. But 9% of transactions over \$100 are also paid in cash. Looking at spending categories, cash is the first or second most widely used instrument for all categories except housing-related items.

Cash is widely used in traditional channels such as face-to-face payments in a shop, or person-to-person payments, but is also widely used for other transactions.

Payment choice by spending category in the US



Source: Surveys of Consumer Payment Choice<sup>12</sup>, 29 September 2014



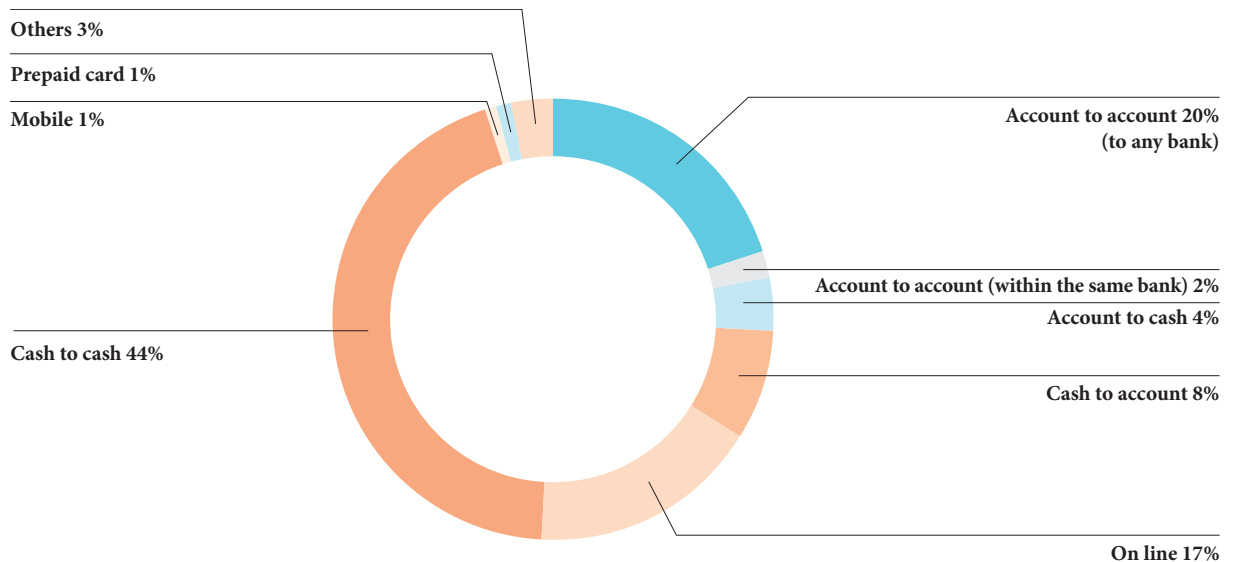
Cash is widely used in traditional channels such as face-to-face payments in a shop, or person-to-person payments.

According to the World Bank, remittances – international money transfers often initiated by migrant workers – totalled \$582 billion in 2014<sup>13</sup>, involving some 232 million migrants. They represent an essential source of funding for developing countries and are three times larger than official development assistance. Remittances rely largely on cash which is used at one or both ends of the transaction: cash-to-cash, account-to-cash and cash-to account amount to 56% of transactions as illustrated below. Cash products are also one of the most cost-effective ways to send money.

Cash is also widely used for consumer-to-machine transactions. In Europe alone, 3.77 million vending machines generate an annual turnover of €11.3 billion. The majority of these machines accept cash.

Cash is also used for online transactions. In 2012, the world’s largest retailer, Walmart launched ‘Pay with Cash’<sup>14</sup>, which enables its customers to shop online and pay with cash at stores. “Our new ‘Pay with Cash’ offering makes it easier for our customers to shop the way they want, where they have access to a broader product selection at Walmart.com coupled with the convenience of payment and shipping as they want.” said Joel Anderson, president and CEO of Walmart.com. In the UK, according to research from online payment services provider, Ukash<sup>15</sup>, one third of online shoppers would prefer to use cash when buying from websites. And 18-24 year-olds are the most likely to want to pay with cash online, with 52% of this group saying they would prefer this method. In India, the taxi-hailing application, Uber offers users the option to pay in cash<sup>16</sup>.

Availability of product types for remittances



Source: Remittance Prices Worldwide - Issue no.12 January 2015

9 <http://www.standard.co.uk/news/london/100m-of-your-money-is-stuck-on-unused-oyster-cards-8678423.html>  
 10 <http://investor.starbucks.com/phoenix.zhtml?c=99518&p=quarterlyearnings>  
 11 <http://www.bostonfed.org/economic/rdr/2014/rdr1401.pdf>  
 12 *The 2011 and 2012 Surveys of Consumer Payment Choice*, Scott Schuh and Joanna Stavins, Federal Reserve Bank of Boston  
 13 <http://remittanceprices.worldbank.org/en/about-remittance-prices-worldwide>  
 14 <http://news.walmart.com/news-archive/2012/04/26/walmart-announces-pay-with-cash-for-online-purchases>  
 15 Ukash Online Payments Survey - April 2013 <https://www.ukash.com/en-gb/news/735/>  
 16 <http://www.finextra.com/news/fullstory.aspx?newsitemid=27347>

**Cash payments work anywhere, at any time and with all economic agents. The technology is embedded in the notes and coins.**





1.3.

## Cash does not require a technology infrastructure

Banknotes and coins enable payments between consumers, businesses and other economic agents and are not dependant on infrastructure. Most alternative payment instruments rely on some form of technology. A card transaction, for instance, requires a cardholder with an active card and a merchant with a compatible payment terminal, as well as a back-office infrastructure to process the transaction. This has several implications.

Cash payments work anywhere, at any time and with all economic agents. The technology is embedded in the notes and coins. The world is increasingly connected and internet access continues to make significant progress. The International Telecommunication Union estimated<sup>17</sup> that, at the end of 2013, 2.7 billion people worldwide used the internet. This means that 4.4 billion people are not online. Figures are even more striking with mobile phones: 6.8 billion mobile cellular subscriptions existed in 2013, or almost one per person! However, in 2012, only half of the world's population was covered by a 3G network, which qualifies as mobile broadband. Even in those countries which have good coverage, there are areas of limited access such as mountain regions or on trains.

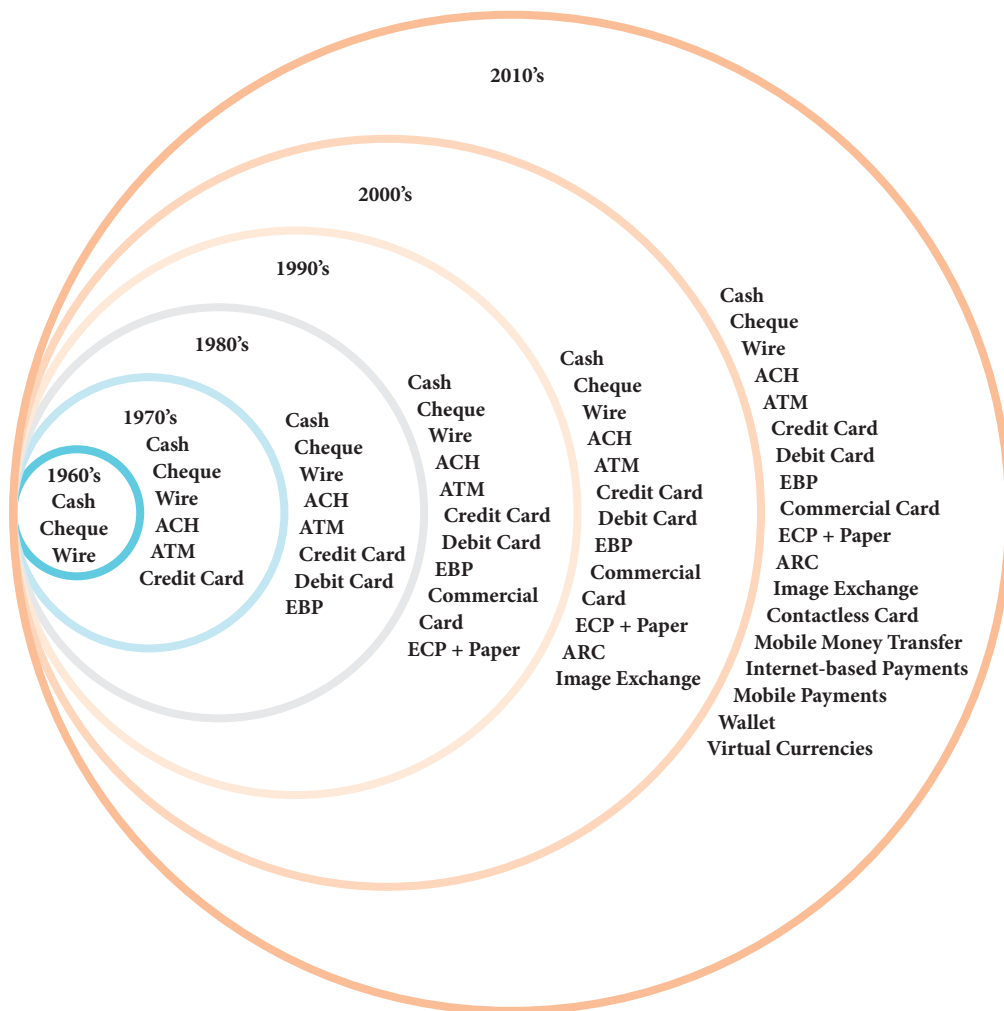
There is inevitably a cost in adopting a payment system, partly related to the infrastructure. A merchant willing to accept payment cards needs to purchase or rent a payment terminal. For large merchants, these costs are easily depreciated over the high volume of transactions but the business case is far more complex for small merchants and start-ups. New businesses can begin operations by accepting cash only, for which no prior investment is required, and only at a later stage, depending on customer demand, choose which other payment options to adopt.

The development of payment infrastructure is largely dependent on network externalities. This means that the value of a payment card to its holder depends on the number of merchants who accept it and the value of the card to a merchant depends on the number of cardholders. As the range of payment instruments grows wider, the network effect increases and makes the launch of new instruments more challenging. Apple launched Apple Pay in the US at the end of 2014; it enables iPhone 6 users to make payments in stores using NFC (near field communication) technology. Shortly after, a consortium of leading retail companies such as Walmart, 7-eleven, Sears and Shell announced the launch of CurrentC, a mobile payment app based on QR codes. The competition between the two products has been described as the “clash of the titans. It’s Betamax vs VHS”<sup>18</sup> according to Forbes journalist Clare O’Connor.

**Cash does not rely on a technology infrastructure. It works anywhere, anytime and for everyone. It is not subject to technological breakdowns or failures.**

Lastly, no technology is exempt from breakdown or failure. At the London Olympics in 2012, the payment systems failed during football events at Wembley<sup>19</sup> despite Visa being one of the global sponsors of the games. Spectators had no option but to pay in cash as payment terminals stopped working. On 24 December 2013, the Belgian card network failed leaving millions of Belgians unable to pay in stores or online or to withdraw cash from ATMs<sup>20</sup> at the peak of Christmas shopping. In June 2008, the Bank for International Settlements published a report<sup>21</sup>, which concluded that the risk of failure within the world's payment and settlement systems is growing because they are becoming more interconnected. The report recommended that banks and payments operators provide better protection against a failure of the financial systems in their stress tests, risk controls, funding requirements and crisis-management plans. However, the global financial crisis, which erupted in October 2008, has likely delayed the achievement of these objectives.

*The diversification of payment options increases the challenge for merchants to select the optimal mix of payments.*



Source: Diederik Bruggink, updated by AGIS Consulting June 2015

17 [http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013\\_without\\_Annex\\_4.pdf](http://www.itu.int/en/ITU-D/Statistics/Documents/publications/mis2013/MIS2013_without_Annex_4.pdf)  
 18 <http://www.forbes.com/sites/clareoconnor/2014/10/31/apple-pay-vs-walmarts-currentc-what-shoppers-need-to-know/>  
 19 <http://www.telegraph.co.uk/technology/news/9437760/London-2012-Visa-blames-Wembley-for-Olympics-card-chaos.html>  
 20 [http://www.lemonde.fr/europe/article/2013/12/24/belgique-les-paiements-electroniques-en-panne-a-la-veille-du-reveillon-de-noel\\_4339324\\_3214.html](http://www.lemonde.fr/europe/article/2013/12/24/belgique-les-paiements-electroniques-en-panne-a-la-veille-du-reveillon-de-noel_4339324_3214.html)  
 21 *The interdependencies of payment and settlement systems*, Bank for International Settlements, June 2008  
<http://www.bis.org/cpmi/publ/d84.pdf>



The range of payment instruments can be restricted in areas of limited access.

1.4.

## Cash has legal tender status

**Its legal tender status gives cash a robust legal framework and facilitates its acceptance and usage. However, restrictions on the use of cash are increasing.**

Legal tender has been developed alongside the evolution of notes and coins. In the 13<sup>th</sup> century, Mongol Emperor Kublai Khan, the first to introduce paper notes and then fiat money, declared his currency the only acceptable currency of the land. He banned the use of gold and silver, as well as private vouchers and coupons that could be a threat to the new currency<sup>22</sup>.

Legal tender is a legal concept and by definition, depends on the legal framework of each country. For example, the legal tender status of euro banknotes is laid down in Article 128 of the Treaty on the Functioning of the European Union; however member States have very different national legislative provisions in relation to legal tender. Consequently, the European Commission issued a recommendation in 2010<sup>23</sup> to clarify the scope and effects of legal tender in the euro zone. The recommendation lays down ten guiding principles:

- **The concept of legal tender** should rely on three main elements: a mandatory acceptance of banknotes and coins, for their full face value, with a power to discharge debts.
- **The acceptance of payments in cash** should be the rule: a refusal is only possible if grounded on reasons related to the ‘good faith’ principle (for example, if the retailer does not have enough change).
- Similarly, **the acceptance of high denomination banknotes** should also be the rule.
- **No surcharges** should be imposed on payments in cash.

- **Member States** should refrain from adopting **new rounding rules** to the nearest five cent.
- **Member States** should take all appropriate measures to prevent **euro collector coins** from being used as means of payments.
- **Stained banknotes** should be brought back to the National Central Banks as they might be the product of a theft.
- **Total destruction of banknotes and coins by individuals** in small quantities should not be prohibited.
- **Mutilation of banknotes and coins for artistic purposes** should be tolerated.
- **The competence to destroy fit euro coins** should not belong to national authorities in isolation anymore.

In principle, legal tender provides a secure legal framework for notes and coins and ensures its widespread acceptance. In practice, it appears that the above guidelines are not enforced strictly. Several countries, including Finland and the Netherlands, have adopted rounding rules whereby amounts are rounded to the nearest five cents in order to reduce the handling of one and two cent coins. Across Europe, some retailers refuse to accept the highest denomination notes – €200 and €500. In October 2014, a customer of French supermarket chain Leclerc was taken into police custody after trying to pay with a genuine €500 note<sup>24</sup>. The cashier and the police suspected the note was a counterfeit. In the Netherlands, several stores no longer accept cash payments. Several countries have imposed caps on cash payments, essentially in order to reduce tax evasion. Payments exceeding these amounts cannot be settled in cash.

*Restrictions on cash usage*

<b>Belgium</b>	<b>€3,000</b>		<b>1 January 2014</b>
<b>Bulgaria</b>	<b>BGN 10,000 (€5,112)</b>		<b>1 July 2011</b>
<b>Czech Republic</b>	<b>CZK 350,000 (€12,763)</b>		<b>1 January 2013</b>
<b>Denmark</b>	<b>DKK 10,000 (€1,340)</b>		<b>1 July 2012</b>
<b>France</b>	<b>€1,000 (Residents)</b> <b>€15,000 (Non-residents)</b>		<b>1 January 2012</b> <b>(revised in July 2015)</b>
<b>Greece</b>	<b>€1,500</b>		<b>1 January 2012</b>
<b>Hungary</b>	<b>HUF 1.5 million (€5,000)</b>		<b>1 January 2012</b>
<b>Italy</b>	<b>€1,000</b>		<b>6 December 2012</b>
<b>Portugal</b>	<b>€1,000</b>		<b>14 May 2012</b>
<b>Slovakia</b>	<b>€5,000</b>		<b>1 January 2012</b>
<b>Spain</b>	<b>€2,500 (Residents)</b> <b>€15,000 (Non-residents)</b>		<b>19 November 2012</b>

Source: "The irreplaceability of cash and recent limitations on its use; why Europe is off track." Edoardo Beretta, September 2014 updated by AGIS Consulting, July 2015

Most countries have defined legal tender in their central bank's mandate or in their legislation. Singapore was the first country to announce the adoption of a form of electronic legal tender as early as 1998. According to Low Siang Kok, Director of Quality at the Board of Commissioners of Currency Singapore<sup>25</sup>, "BCCS envisages that an electronic legal tender system would reduce the cost of handling physical cash, improve the efficiency of business transactions and boost the cashless business environment for Singapore. It would also support the government's drive to turn Singapore into a cashless society. At its strategic planning seminar in 1998, BCCS set as its corporate vision the introduction of a Singapore electronic legal tender (SELT) within 10 years." However, in 2014, the SELT project no longer seems to be on the agenda and the Singapore Mone-

tary Authority continues to issue banknotes, which increased in value by 6% in 2012.

In 2014, the Central Bank of Ecuador announced plans to create a virtual currency, which would be used alongside the U.S. dollar, which is legal tender in Ecuador<sup>26</sup>. The first virtual money accounts were opened in December 2014<sup>27</sup>. Following the banking crisis of 1999, the Ecuadorian peso sucre banknotes lost legal tender status in favour of the US dollar. Today, Ecuador only issues centavos coins.

22 Tullock G, *Paper Money - A Cycle in Cathay*, February 2008. The Economic History Review

23 [http://europa.eu/rapid/press-release\\_IP-10-331\\_en.htm](http://europa.eu/rapid/press-release_IP-10-331_en.htm)

24 [http://www.huffingtonpost.fr/2014/10/08/video-garde-a-vue-billet-500-euros-leclerc-excuse\\_n\\_5954012.html](http://www.huffingtonpost.fr/2014/10/08/video-garde-a-vue-billet-500-euros-leclerc-excuse_n_5954012.html)

25 *Singapore Electronic Legal Tender (SELT) A Proposed Concept*. Low Siang Kok, Director (Quality), Board of Commissioners of Currency Singapore in *The Future of Money*, OECD, 2002

26 <http://www.bloomberg.com/news/articles/2014-08-11/ecuador-turning-to-virtual-currency-after-oil-loans-correct>

27 <http://www.bce.fin.ec/index.php/boletines-de-prensa-archivo/item/739-dinero-electronico-fue-innopolis>



The European Central Bank, in Frankfurt, Germany, is the central bank for Europe's single currency, the euro.



# Cash is also a store of value

**Besides payments, a key function of money is to store value. Cash provides a liquid and secure store of value. The 2008 global financial crisis clearly illustrated its importance.**

Payment is only one of the functions of cash. A second essential function is to store value.

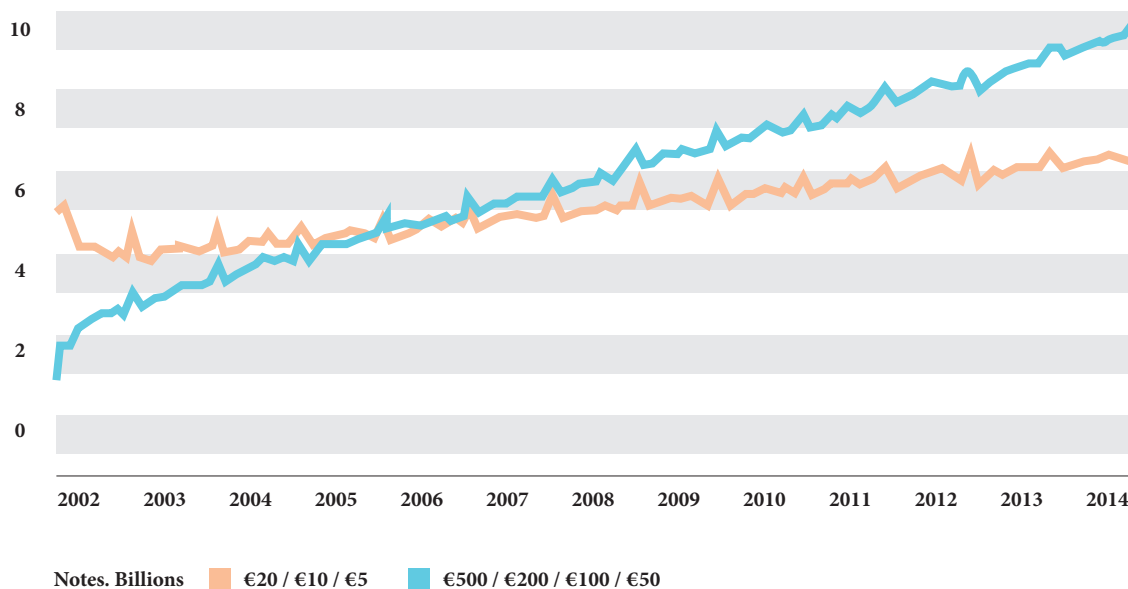
Banknotes are a financial asset and although they do not bear interest, they offer liquidity and security.

Several studies have measured the share of hoarded banknotes versus transactional banknotes. Helmut Stix has estimated that roughly 10% of cash in circulation was used for transactions in Austria in 2004<sup>28</sup>. B. Fischer, P. Köhler and F. Seitz<sup>29</sup> estimate that around

25 - 35% of all currency in circulation in the euro zone is used for domestic transactions. The remaining 65 - 70% is either hoarded or held abroad.

The mix of denominations in circulation provides a rough assessment of the importance of hoarding. In Switzerland, the CHF 1,000 note, which is one of the highest denominations in the world, represents 61% of the value of notes in circulation<sup>30</sup>, but this note is rarely used in daily transactions.

Change in volume of low and high denomination euro banknotes



Source: European Central Bank, December 2014



The store of value function also largely explains the international demand for some currencies. Estimates by the US Federal Reserve suggest that as much as 60% of US currency is held overseas<sup>31</sup>. In the case of the euro, an estimated 25% of the euro currency and possibly more was circulating outside the euro zone at the end of 2013<sup>32</sup>. For foreigners, an international currency represents an asset which is liquid, secure and stable in value. These attributes are often not provided by their own currency, particularly after periods of economic instability.

Interest rates are a key factor in explaining currency demand and, in particular, demand for hoarding. Lower interest rates reduce the opportunity cost of holding cash and make it more attractive. Another factor is the level of confidence in the banking and financial system. According to Tom Cusbert and Thomas Rohling<sup>33</sup>, currency demand in Australia increased abnormally fast in late 2008, following the collapse of Lehman Brothers, and resulted in a 12% rise in the value of banknotes. Around 20% of this can be attributed to the lowering of interest rates and the increase in income from the government stimulus. The remaining 80% of the rise may be due to an increase in precautionary holdings in response to uncertainty in the financial sector.

Using survey data from ten Central, Eastern and South-Eastern European countries, Helmut Stix has analysed why households in transition economies prefer to hold sizeable shares of their assets in cash at home rather than in banks<sup>34</sup>. The paper documents the relevance of this behaviour and shows that cash preferences cannot be fully explained by whether people are banked or unbanked. The analysis reveals that a lack of trust in banks, memories of past banking crisis and weak tax enforcement are important factors. Moreover, cash preferences are stronger in dollarised economies where a “safe” foreign currency serves as a store of value.

28 *The Impact of ATM Transactions and Cashless Payments on Cash Demand in Austria*, Helmut Stix, OENB, Monetary Policy & the Economy Q1/04

29 *The demand for Euro Area Currencies: Past Present and Future*, B. Fischer, P. Köhler and F. Seitz, ECB, Working Paper Series n° 330 / April 2004

30 [http://www.snb.ch/fr/i/about/cash/id/cash\\_circulation](http://www.snb.ch/fr/i/about/cash/id/cash_circulation)

31 *The Use and Counterfeiting of United States Currency Abroad*, United States Treasury Department, September 2006

<http://www.federalreserve.gov/boarddocs/RptCongress/counterfeit/counterfeit2006.pdf>

32 *The International Role of the Euro*, ECB July 2014

<http://www.ecb.europa.eu/pub/pdf/other/euro-international-role-201407en.pdf?456475aa49c78ac8f912d9828d374c52>

33 *Currency Demand during the Global Financial Crisis: Evidence from Australia*, Tom Cusbert and Thomas Rohling, Reserve Bank of Australia

34 *Why Do People Save in Cash? Distrust Memories of Banking Crises, Weak Institutions and Dollarization* by Helmut Stix - Working Paper 178 Oesterreichische Nationalbank, 27 July 2012



2.

# Cash is trust

**Cash is an increasingly secure payment instrument, as illustrated by the declining levels of counterfeit currency in most markets.**

**In view of increasing cybercrime, payment fraud, identity theft and data breaches, cash provides identity protection and privacy.**

## 2.1

# Cash generates security

Different payment instruments pose different security risks. Those associated with cash include loss, theft and counterfeit while risks associated with alternative payments are far more diverse and complex. They include card theft, card skimming, card-not-present fraud, identity theft, account takeover, fraudulent transactions, data breaches and more. As a result, it is difficult to accurately compare the risks associated with cash with those of non-cash payments, but nonetheless it is worthwhile to assess the scope of the problem.

According to the European Central Bank, the total value of fraudulent transactions involving cards issued within SEPA (the Single Euro Payments Area comprising the 28 Member States of the European Union, as well as Iceland, Norway, Liechtenstein, Switzerland, Monaco and San Marino) amounted to €1.33 billion in 2012. This represented an increase of 14.8% from 2011<sup>35</sup> and amounts to €2.58 per person. In the US, the LexisNexis *2014 True Cost of Fraud Study*<sup>36</sup> concluded that merchants lost a significantly higher percentage of revenue to payment fraud than in 2013 (0.68% versus 0.51%). The increase was due to a higher volume of successful fraudulent transactions: the average merchant suffered 133 successful fraudulent transactions per month in 2014, 46% more than in 2013.

In the fiscal year 2013, the US Secret Service recovered approximately \$156 million in counterfeit US currency<sup>37</sup> compared to a total

circulation of just under \$1,198 billion. In the euro zone, a total of 838,000 counterfeit euro banknotes were seized in 2014<sup>38</sup> out of a total circulation exceeding 16 billion notes; in value, this represents less than €35 million. In India, the number of counterfeit notes detected by commercial banks and the reserve bank reached 488,273 for the fiscal year 2013-2014 compared to a total circulation of over 77 billion notes<sup>39</sup>.

## **Security consists above all, in providing an environment in which consumers feel comfortable to transact.**

There are also key differences between cash and non-cash risks.

Firstly, in the case of cash, individuals and merchants can adopt straightforward measures to reduce risks. The most obvious are to reduce the value of cash stored, deposit it in a bank account or keep it in a safe. The security measures for electronic payments are far more complex and often depend on external providers. Furthermore, merchants are incurring increasing costs to combat payment fraud. In the 2015 Europol report, *Exploring Tomorrow's Organised Crime*<sup>40</sup>, the law enforcement agency classifies currency counterfeiting as a declining criminal activity whereas cybercrime, which includes payment fraud, is the fastest-growing activity.

Secondly, in the event of cash losses, the liability lies with the user, but for non-cash losses it is largely collective. If someone loses their wallet, they are accountable for the coins and banknotes lost.

But if one or several cards are in that wallet, in the majority of cases, they will not be liable for the fraudulent use of those cards. Those costs are borne by the issuers and are included in their cost base. In other words, those costs are actually borne collectively by the community of card users.

Thirdly, in the case of cash, potential losses are limited to the value of cash involved. But in the case of electronic payment fraud, the consequences can be much worse and sometimes dramatic, for instance, in cases of identity theft and data breaches (see page 29).

## Identity theft

In one notorious case of identity theft, the criminal, a convicted felon, not only incurred more than \$100,000 of credit card debt, obtained a federal home loan, and bought homes, motorcycles, and handguns in the victim's name, but called his victim to taunt him – saying that he could continue to pose as the victim for as long as he wanted because identity theft was not a federal crime at that time – before filing for bankruptcy, also in the victim's name. While the victim and his wife spent more than four years and more than \$15,000 of their own money to restore their credit and reputation, the criminal served a brief sentence for making a false statement to procure a firearm, but made no restitution to the victims for the harm he had caused. This case, and others like it, prompted Congress in 1998 to create a new federal offence of identity theft.

Source: US Department of Justice  
<http://www.justice.gov/criminal/fraud/websites/idtheft.html>

## Data breaches

Gemalto, a leading supplier of digital security has developed the Breach Level Index which aggregates information about data breaches around the world. The 2014 report<sup>41</sup>, aptly titled *2014 Year of Mega Breaches & Identity Theft* estimates that over 1 billion personal records were compromised in 2014 in the course of 1,541 identified incidents, representing a 78% increase over 2013. Identity theft is the main motivation and is associated with 54% of these attacks. The report concludes “the year 2014 will be a tipping point for data security and identity protection because data protection became more prominent in the public consciousness.”

Security consists, above all, in providing an environment in which consumers feel comfortable to transact. There is evidence that consumers are increasingly apprehensive of payment card fraud and associated threats including identity fraud. The IT vendor Unisys has developed an index to measure public perception of safety and security globally<sup>42</sup>. In 2014, the index showed that the top two concerns are identity theft and bank-card fraud, ahead of national security in relation to war and terrorism.

In this context, cash offers a way to protect personal identity. According to a survey<sup>43</sup> conducted by GfK in the US in October 2014, following high-profile security breaches at major retailers, 66% of consumers are concerned that their information will be stolen, and 61% of 18 to 24-year-olds are more likely to use cash compared to only 49% of those 65 and older.

35 *Third report on card fraud*, ECB, February 2014

36 <http://www.lexisnexis.com/risk/downloads/assets/true-cost-fraud-2014.pdf>

37 U.S Secret Service 2013 Annual Report [http://www.secretservice.gov/USSS\\_FY13AR.pdf](http://www.secretservice.gov/USSS_FY13AR.pdf)

38 ECB Press Release 23 January 2015 - Biannual information on euro banknote counterfeits - <http://www.ecb.europa.eu/press/pr/date/2015/html/pr150123.en.html>

39 Reserve Bank of India Annual Report 2013-2014 <http://rbi.org.in/scripts/AnnualReportPublications.aspx?Id=1126>

40 Exploring Tomorrow's Organised Crime, 2015, European Police Office - <https://www.europol.europa.eu/sites/default/files/edi/EuropolReportDigitalCove.html>

41 <http://www.breachlevelindex.com/pdf/Breach-Level-Index-Annual-Report-2014.pdf>

42 <http://www.unisyssecurityindex.com/system/reports/uploads/303/original/Unisys%20Security%20Index%20US%20May%202014.pdf?1399929399>

43 <http://www.mainstreet.com/article/credit-card-breaches-scare-more-men-and-millennials-into-paying-with-cash>



**Cash is issued by central banks. The objectives of the central bank in terms of cash supply are based on security quality, efficiency and confidence.**

# Cash is a public good

**In modern society, people need to pay for their most basic needs including food, water and shelter. Cash is the only payment instrument which is issued in the best interests of society by a public authority.**

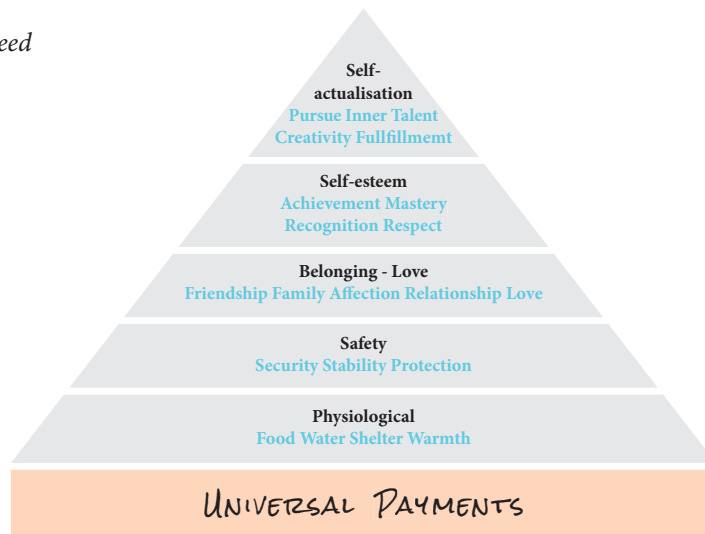
Cash is issued by central banks or monetary authorities. It is typically part of the central bank's mandate to supply banknotes. Coins are generally supplied by Treasury Departments. In both cases this service is carried out in the best interests of the public. The precise objectives of the central bank in terms of cash supply vary from country to country, but they are generally based on four principles:

- Security: banknotes should be difficult to counterfeit
- Quality: notes which are no longer fit for circulation are withdrawn and destroyed;
- Efficiency: the overall cost of the issue and circulation of notes should be kept to a minimum;
- Confidence: the public should have a high level of trust in its banknotes.

In 1943, American psychologist Abraham Harold Maslow published *A Theory of Human Motivation*<sup>44</sup> and developed his theory on the hierarchy of needs. It is often represented as a pyramid with the most basic needs at the bottom and other needs as successive layers, with “self-actualisation” at the top. As each need is satisfied, the desire grows to achieve the next.

In Maslow's view, the first level comprises the physiological needs, which are essential to human behaviour: air, water and food. In modern society, with 54% of the global population living in cities, most people need to pay to obtain food and water. Accordingly, payment has become a basic need. Some non-cash payments aim to fulfil higher needs; in particular, many premium payment cards clearly aim to provide self-esteem, status and recognition. Marketing experts will probably argue that the most profitable products are those which satisfy the higher needs. However, in modern society, payments are required to cover the most basic needs.

*Payments are a basic need*



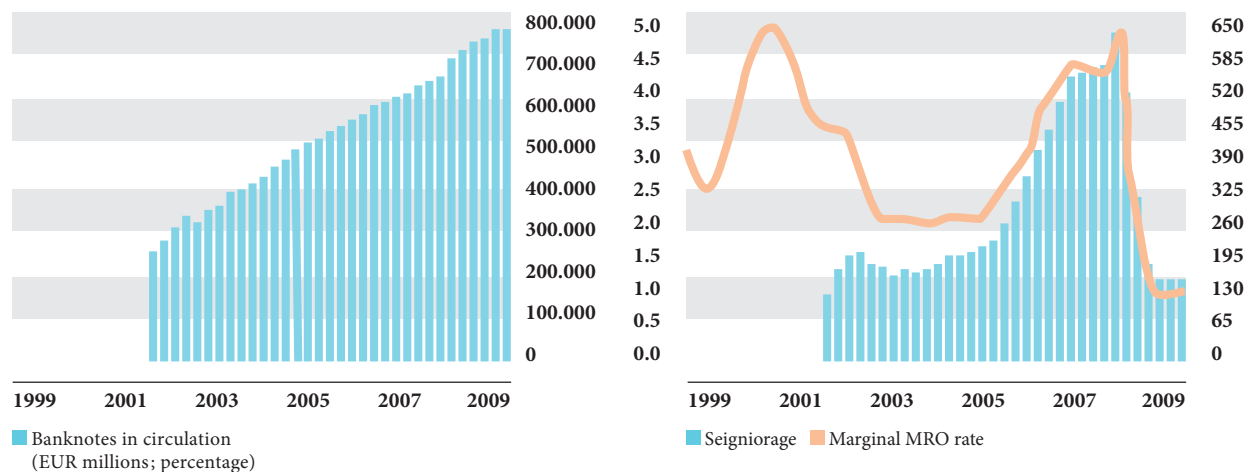
Cash generates revenue for the central bank and ultimately the state in the form of *seigniorage*. The word derives from the old French word *seigneurage*, which refers to the right of the lord to mint money<sup>45</sup> and consists in the net revenue derived from the issuing of banknotes and coins.

Banknotes are a non-interest bearing asset. But when they are issued, they are recorded as a liability on the central banks' balance sheet and invested in interest-bearing assets. Seigniorage is the difference between the interest earned and the costs of producing and distributing banknotes.

For coins, the process differs as these are not redeemed by the issuing authority. Consequently, the seigniorage is the difference between the face value and the cost of production and is generated at the time of sale.

Simply put, seigniorage is an income source for the central bank and consequently the government. It is sometimes viewed as a tax. In the case of the euro, the applicable interest rate is the marginal rate for the Eurosystem's main refinancing operations (MRO). This rate has varied considerably over the past decade as illustrated below. It is also worth noting that currencies held by non-residents also generate income.

*Euro banknotes in C-circulation, ECB seigniorage and the marginal MRO rate<sup>46</sup>*



Source: European Central Bank, May 2010

44 in *Psychological Review*

45 <http://www.cnrtl.fr/etymologie/seigneurage>

46 Main Drivers of the ECB Financial Accounts and ECB Financial Strength over the First 11 Years, by Olivier Vergote, Werner Studener, Ioannis Efthymiadis and Niall Merriman. Occasional Paper Series n° 111/May 2010



**Seigniorage is a source  
of income for the central bank  
and consequently the state.**



## Cash enables an immediate transfer of value

When a banknote or coin is handed over by a customer in a store, there is an instantaneous settlement of that transaction. The merchant becomes the owner of the funds and can use them immediately, e.g. to give change to the next customer or pay an employee. The merchant incurs no payment risk and no credit risk.

If the same transaction is settled using a non-cash payment system, the settlement can take up to several months. While large merchants may receive settlement the following day, small or mid-sized stores receive the funds 2 or 3 days later. Some merchants, considered by card processors and acquirers as risky, may receive the funds in batches, as much as several months later.

The banking community is clearly aware of the opportunities in accelerating the settlement of transactions. Global payments technology provider Clear2Pay has

undertaken a comprehensive review of faster payments initiatives across the world<sup>47</sup>.

**Cash is a real-time payment instrument. It does not involve payment risk or credit risk.**

It defines a faster payment as a “domestic, inter-bank (i.e. not alternative payment schemes), purely electronic payment system in which irrevocable funds are transferred from one bank account to another and where confirmation back to the originator and receiver of the payment is available in one minute or less.” In other words, these initiatives are undeniably faster than “traditional” card payments, but in most cases are not real-time, unlike cash transactions. Transaction volumes

for these initiatives remain relatively low; the Japanese fast payment system Zengin, which was the first to be established in 1973, processes 6 million transactions per day for a total population of 127 million.

For retailers, the delay in the settlement of the transaction presents two challenges. Firstly, they bear the payment risk as long as they have not received the funds. Secondly, they do not earn interest on the funds until they reach their account.



**When a banknote or coin is handed over by a customer in a store, there is an instantaneous settlement of that transaction.**





2.4

## Cash is a contingency and fall-back solution

**Cash is a critical infrastructure and plays an essential role in emergencies. The cash cycle has demonstrated its robustness and resilience in times of natural and man-made disasters.**

In October 2014, US President Obama's credit card was declined at a restaurant as he was dining with his wife<sup>48</sup>. Luckily for the restaurant, the First Lady picked up the cheque. Payment transactions are denied for a number of reasons, as many cardholders have discovered: the card limit may have been reached; suspicious transactions have been detected and the issuer may have blocked the card; the card has expired; the magnetic stripe may have been demagnetised or the chip damaged; the retailer's equipment may be out of service

or simply out of paper; the telecoms network might be having problems, etc. There are also transactions for which some or all cards are not accepted.

As a result, cash is very often perceived as a fall-back solution when other payment options fail. The research paper *Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data*<sup>49</sup> measured consumers' use of cash in Canada, Australia, Austria, France, Germany, the Netherlands and the US between 2009 and 2012. The report estimates that average cash balances vary from \$51 in the Netherlands to \$148 in Austria and this difference is essentially due to the greater use of cash in one country than another. These balances vary from 1.5 times the daily consumer expenditure in Australia to 4.8 times in Austria. This reflects the importance of precautionary holdings as consumers carry far more cash than they actually require.

### Average cash balances

	Australia	Austria	Canada	France	Germany	The Netherlands	US
Cash balances in the wallet (M) in USD	59	148	64	70	123	51	74
M/e*	1.48	4.78	4.38	4.13	4.15	2.87	2.44

\* M/e is the ratio of cash balances to daily expenditures. Values are expressed in PPP-adjusted US dollar.

Source: *Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data*  
John Bagnall, David Bounie, Kim P. Huynh, Anneke Kosse, Tobias Schmidt, Scott Schuh, and Helmut Stix  
Federal Reserve Bank of Boston - Working Paper n° 14-4. 8 May 2014



Cash plays a key contingency role for national payments systems in case of natural disasters or financial crises.

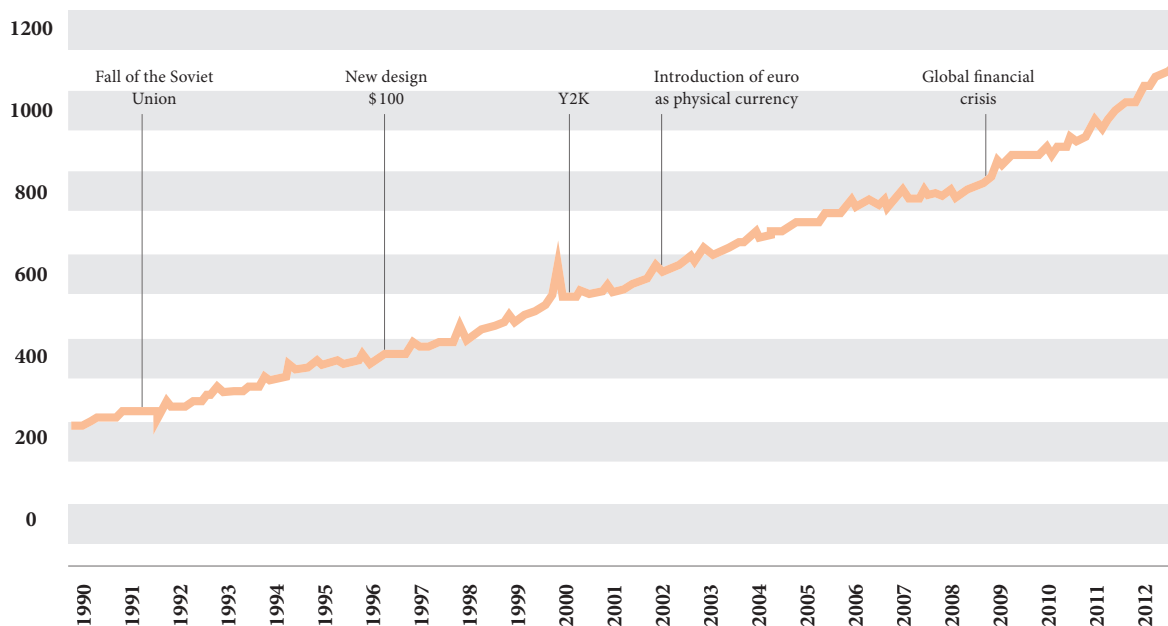
Card issuers also recognise the fundamental role of cash as a fall-back solution, as most cards provide for emergency cash advances.

Cash also plays a key contingency role for national payments systems in case of natural disasters or financial crises. The cash cycle demonstrated its resilience in natural disasters such as Hurricane Katrina in 2005, the 2011 earthquake and tsunami in Japan, and Typhoon Bopha which hit the Philippines in 2012. Unsurprisingly, the US FEMA – Federal Emergency Management Agency – now recommends to include cash in an emergency supply kit<sup>50</sup>. Cash also plays a role in the event of technology failures. In 1999, as the millennium approached, demand for banknotes increased significantly as consumers feared bank information systems could be affected by the Y2K computer bug.

For many experts, including the World Bank, the impact of weather-related events will likely increase in the future under the combined pressure of global warming and the expansion of many cities in hazard-prone areas<sup>51</sup>.

More recently, the collapse of Lehman Brothers and the ensuing global financial crisis also led to a significant increase in demand for currency. In Australia, the Reserve Bank estimates that demand for currency increased by AUD 5 billion or 12% in late 2008<sup>52</sup> although, unlike in many countries, the solvency of Australian banks was not in jeopardy. The Reserve Bank believes the rise was essentially due to an increase in precautionary holdings. The euro zone also registered a strong increase in the number of notes in circulation in the first half of October 2008, equivalent to a value of €35-40 billion<sup>53</sup>.

*The impact of Y2K and the global financial crisis on US currency*



Source: US Federal Reserve Bank, June 2013



According to Dario Negueruela, Chief Cashier of the Banco de España<sup>54</sup>, “Central banks, particularly after the ordeal of the crisis, have an important responsibility today as key managers in crisis situations. It is no longer sufficient to say that they are doing their work well; rather the important thing is to be in a position to respond to emergency situations and to anticipate

unforeseeable events or exceptional demands.” Quality management and cost savings are no longer enough. Business continuity exercises study the systems that enable an institution or company to continue to perform its activities when an unexpected event occurs that affects the institution itself.



47 <http://www.clear2pay.com/sites/default/files/brochures/WhitePaper-Clear2Pay-Flavours-of-Fast.pdf>  
48 [http://www.huffingtonpost.com/2014/10/17/obama-credit-card-declined-nyc\\_n\\_6004754.html](http://www.huffingtonpost.com/2014/10/17/obama-credit-card-declined-nyc_n_6004754.html)  
49 <http://www.bostonfed.org/economic/wp/wp2014/wp1404.pdf>  
50 [http://www.fema.gov/media-library-data/1390846764394-dc08e309debe561d866b05ac84daf1ee/checklist\\_2014.pdf](http://www.fema.gov/media-library-data/1390846764394-dc08e309debe561d866b05ac84daf1ee/checklist_2014.pdf)  
51 <http://www.ibtimes.com/natural-disasters-are-hitting-harder-not-because-global-warming-1141461>  
52 Currency Demand during the Global Financial Crisis: Evidence from Australia - Tom Cusbert and Thomas Rohling - Research Discussion Paper 2013-01 - Reserve Bank of Australia  
53 European Central Bank Annual Report 2008  
54 Cash and the Financial Crisis, by Dario Negueruela, Director of the Cash and Issue Department. Banco de España - 09.09.2014



A cashless society may bring along its new set of challenges: the protection of people's privacy, and new measures against sophisticated internet crimes.

## Cash protects privacy and anonymity

**Cash provides an area of freedom, where people can transact and protect their privacy. In a society where big data is leading to the increasing monetisation of personal information, anonymity is becoming scarcer and more valuable.**

Anonymity is a specific attribute of cash. Cash does not require the disclosure of personal information between both parties involved in a transaction. This feature has been the subject of a continued debate between those who urge for complete traceability of transactions and the advocates of privacy.

For economist Kenneth Rogoff, “paper currency facilitates making transactions anonymous, helping to conceal activities from the government in a way that might help agents avoid laws, regulations and taxes.”<sup>55</sup> This is evidenced, he claims, by the fact that outstanding currency significantly exceeds transaction needs both in the US or the euro-zone.

On the other hand, in Sweden, which is often considered as a near-cashless society, former Police Chief and Interpol President Björn Eriksson says there are reasons to be cautious: “Little has been said about the major challenges that a cashless society brings. It infringes on people’s privacy. It can make life difficult in sparsely populated areas. It can make a society vulnerable and increasingly open to sophisticated internet crimes.”<sup>56</sup>

Yes, banknotes are used by tax evaders and criminals, just as they are used by billions of people all over the world for perfectly legitimate transactions. The reduction of cash in circulation, or even its elimination, would have no impact on crime and tax evasion. Kari Takala<sup>57</sup> of the Central Bank of Finland states that the abolition of cash would not stop tax evasion. He estimates that the use of cash in Finland in 2014, repre-

sented €18 billion whereas the grey economy amounts to approximately €2 billion. Therefore, assuming it is exclusively cash-based, the grey economy accounts for 10% of cash in circulation, at the most.

Yes, cash enables two parties to carry out a transaction without revealing their identities. But this anonymity is limited by several factors. Regulations restrict the use of cash. A number of countries have imposed caps on cash transactions as illustrated in the chart on page 21. Some countries also prohibit certain types of transactions to be carried out in cash; in France, salaries above €1,500 cannot be paid in cash<sup>58</sup>. At an international level, the Financial Action Task Force (FATF) recommendations require that countries detect the physical cross-border transportation of currency through a declaration system<sup>59</sup>. Technology also limits the anonymity of cash. Serial number tracking solutions provide law enforcement agencies with tools to trace banknotes that have been connected to criminal activity. Forensic taggants with unique chemical signatures are used to protect cash; in the event of a robbery, the stolen notes can be traced to the crime<sup>60</sup>. The physical bulk of currency is also a limit to its anonymity. A million dollars in \$100 notes weighs approximately 10kg.

Yes, cash can be used to avoid taxes and engage in illegal activities. But so can many other instruments. In the 2014 documentary *The Price We Pay*<sup>61</sup>, it is estimated that approximately \$22,000 billion or 10% to 15% of global financial wealth is held in tax havens. This figure represents around 22 times the value of US currency in circulation. In other words, tax evasion associated with cash is only the visible tip of the iceberg. Crypto-currencies such as Bitcoin are another perfectly anonymous payment instrument. A number of national and international regulators and authorities are still trying to understand their implications and adjust the regulatory framework. Canada has introduced legislation to require crypto-currency exchanges to register and to report suspicious transactions that may be linked to money laundering and terrorist financing<sup>62</sup>. Regulators in the state of New York are proposing to issue a “Bit License” to protect consumers, prevent money laundering

and enforce cyber security. Some countries, like China, have ruled that financial institutions cannot accept any Bitcoin transactions. The FATF suggests a conceptual framework for understanding and addressing the risks that virtual currencies represent to measures that combat money laundering and the financing of terrorism<sup>63</sup>. Notably, the Chair of the Board of Governors of the Federal Reserve System, Janet Yellen, said at a US Senate banking committee hearing in February 2014: “It’s important to understand that this is a payment innovation that’s happening outside the banking industry. The Federal Reserve simply does not have the authority to regulate Bitcoin in any way.”<sup>64</sup>

Yes, cash offers a space of anonymity. And in a society where cybercrime is on the rise, where, social media are transforming consumers’ perception of privacy, where big data is leading to the monetisation of

consumer information, the anonymity space is becoming smaller and smaller. In this context, cash is the last frontier for anonymous but controlled transactions. A regulated anonymous payment instrument is essential. Firstly, because some degree of anonymity is perfectly legitimate. Secondly, in the absence of a regulated instrument, there is a risk that consumers could opt for unregulated ones. Lastly, the absence of anonymity could lead consumers to abandon some transactions. The brand consultancy Method conducted an experiment to discover what would happen when people’s private spending habits become public. The participants were challenged to log every purchase using an Instagram picture. It became clear that there was a significant grey area not covered by the Instagram feed, constituting all the purchases that the customers deemed uncomfortable or inappropriate<sup>65</sup>.

55 *Costs and benefits to phasing out paper currency*, by Kenneth Rogoff, Harvard University, May 16 2014

56 <http://www.thelocal.se/20141104/why-sweden-should-fear-going-cashless>

57 Käteisen poistaminen ei lopettaisi veronkiertoa (in Finnish) by Kari Takala, Bank of Finland

[http://www.suomenpankki.fi/fi/suomen\\_pankki/ajankohtaista/blogit/kari\\_takala/Pages/Kateisenpoisto\\_ei\\_lopeta\\_veronkiertoa.aspx](http://www.suomenpankki.fi/fi/suomen_pankki/ajankohtaista/blogit/kari_takala/Pages/Kateisenpoisto_ei_lopeta_veronkiertoa.aspx)

58 <http://www.economie.gouv.fr/dgccrf/Moyen-de-paiement>

59 [http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF\\_Recommendations.pdf](http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf)

60 <http://www.dailymail.co.uk/news/article-2943831/Talk-money-laundering-Criminal-gangs-WASHINGTON-stolen-bank-notes-bid-remove-anti-theft-SmartWater-dye.html>

61 *The Price We Pay* a feature documentary by Harold Crooks (Canada)

<http://www.bankofcanada.ca/wp-content/uploads/2014/11/remarks-131114.pdf>

63 FATF Report : Virtual Currencies Key definitions and Potential AML/CFT Risks - June 2014

<http://www.fatf-gafi.org/media/fatf/documents/reports/Virtual-currency-key-definitions-and-potential-aml-cft-risks.pdf>

64 <http://fortune.com/2014/02/27/janet-yellen-fed-will-steer-clear-of-bitcoin/>

65 <http://method.com/work/method-money#privacy>

**Where social media is transforming consumers' perception of privacy, where big data is leading to the monetisation of consumer information, the space for anonymity is becoming smaller and smaller. In this context, cash is the last frontier for anonymous but regulated transactions.**





3.

# Cash is efficient

**Innovation has widely contributed  
to the efficiency of cash.**

**Cash is a cost-efficient payment instrument,  
particularly for low-value transactions  
which represent the bulk of retail payments.**

3.1

## Cash is the most widely used payment instrument

**Cash remains the most commonly used method of payment, accounting for 85% of transactions worldwide.**

Peter Drucker wrote “Efficiency is doing things right. Effectiveness is doing the right things.”<sup>66</sup> Effectiveness measures whether the actual output meets the desired output. Applied to payment instruments, effectiveness could be measured by the overall volume of transactions, the value of transactions, the rate of failed transactions, etc.

Measuring cash transactions is challenging as they are anonymous and not necessarily registered at individual level. A number of countries have undertaken payment diary studies in order to gain a better understanding of cash usage. A comparison of the results of payment diaries in seven countries are aggregated in the ECB paper *Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data*<sup>67</sup>. The results are summarised on page 49.

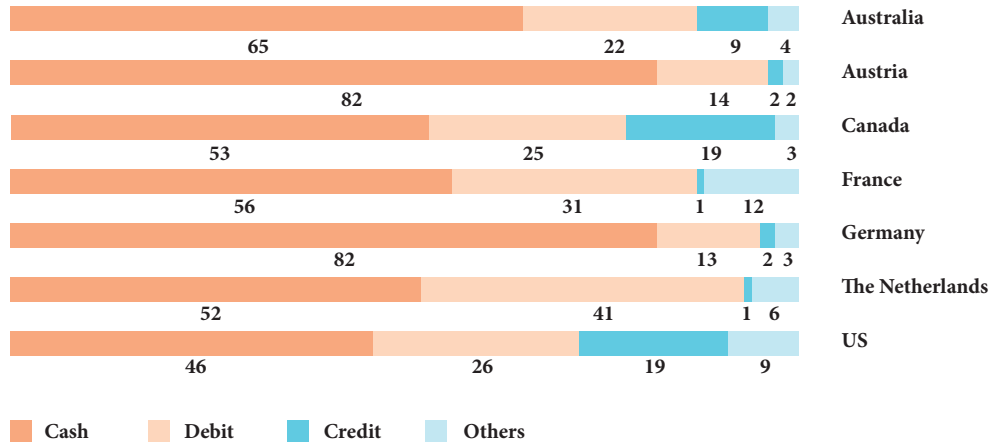
In all seven countries, cash is the leading payment instrument measured in terms of transaction volume, well ahead of debit cards and credit cards. The share of cash varies significantly across countries, from 46% in the US to 82% in Austria and Germany. Debit cards are the second most widely used instrument followed by credit cards. In spite of all the hype around ‘new’ payment alternatives including mobile wallets, or virtual currencies, other instruments play a marginal role, with the exception of France where cheques are still widely used, although their volumes are steadily declining.

In value terms, the role of cash is less significant. The data clearly demonstrates that cash is used essentially for low-value transactions. In all countries cash is predominant for the smallest 50% of transactions. In three countries – Australia, Austria and Germany – cash is also the leading instrument overall.

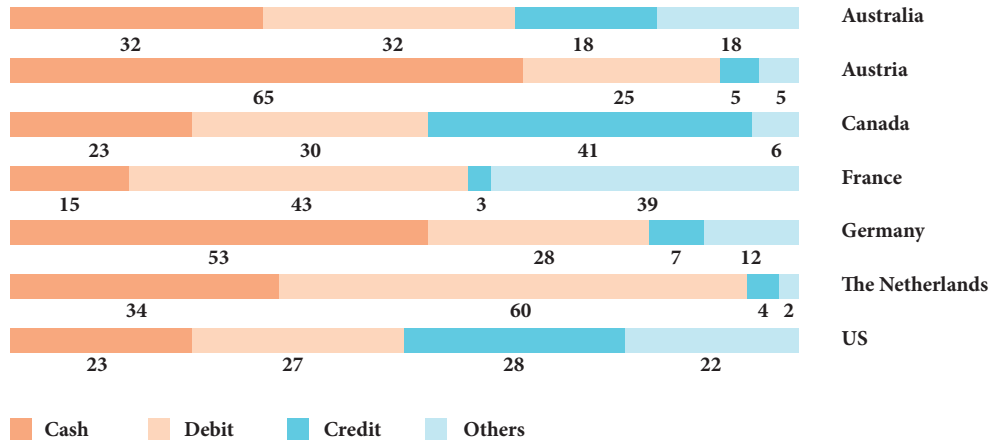
The above study only covers a group of countries with mature payment markets and the results cannot be extrapolated to other markets. However, markets with less sophisticated payment industries are likely to be more cash intensive. According to the MasterCard report *Measuring progress toward a cashless society*, cash accounts for 85% of transactions worldwide<sup>68</sup>. The report concludes, “Yet despite this progress, cash today remains the most commonly used method of payment when looked at from a global perspective.”



Payment share by volume



Payment share by value



Source: Consumer Cash Usage A Cross-Country Comparison with Payment Diary Survey Data, June 2014

66 *The Effective Executive*, Peter F. Drucker

67 Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data, John Bagnall, David Bounie, Kim P. Huynh, Anneke Kosse, Tobias Schmidt, Scott Schuh and Helmut Stix in Working Paper n° 1685/ June 2014. European Central Bank. <http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1685.pdf>

68 *Measuring progress toward a cashless society*, Hugh Thomas - MasterCard Advisors [http://www.mastercardadvisors.com/\\_assets/pdf/MasterCardAdvisors-CashlessSociety.pdf](http://www.mastercardadvisors.com/_assets/pdf/MasterCardAdvisors-CashlessSociety.pdf)

**Considerable efforts are put into user-friendly banknote design. Designers focus on making notes easy to recognise and authenticate while difficult to counterfeit.**



## Cash is easy to use

Considerable efforts are put into user-friendly banknote design. Designers focus on making notes easy to recognise and authenticate while difficult to counterfeit. Specific efforts have been aimed at assisting the blind, the visually impaired, and the illiterate to identify the various denominations and their authenticity<sup>69</sup>. These include different sizes, different colours, large and visible numerals, tactile properties. Various devices are available to help the blind recognise the notes; these range from simple manual tools, which measure the size of the note, to automated readers, particularly in countries such as Canada where all denominations are the same size<sup>70</sup>. New smartphone applications can now recognise notes, including different currencies by using the camera. It is worth noting that with the ageing population, the number of people with visual impairment is expected to increase.

These efforts are recognised by consumers. The perceptions of different payment instruments has been compared across six countries – Austria, Canada, France, Germany, the Netherlands and the US – in *Consumer Cash Usage, a Cross-Country Comparison with Payment Survey Data*<sup>71</sup>. Cash is ranked higher for ease of use than debit cards in three countries –

Austria, Canada and Germany – and higher than credit cards in all countries but the US. The authors conclude that the perceived ease of using cash was highly significant and positive.

### **Cash is recognised as a convenient and user-friendly payment instrument. Particular efforts are directed towards vulnerable groups such as the blind and visually impaired.**

The European Commission measures the perceptions of the euro, including the practical aspects of handling coins and banknotes, through regular polls covering all 18 member states of the euro zone<sup>72</sup>. An overwhelming 94% of respondents think that it is easy to recognise and handle euro banknotes. The polls show that 79% of respondents find it easy to distinguish and handle euro coins.

The Dutch Central Bank has been investigating the psychological aspects of choosing a payment method using two innovative approaches: a virtual-reality study

and a neuro-scientific study<sup>73</sup>. The virtual reality study consists of observing payment behaviour and attempting to influence it by manipulating different variables. These include the physical security of the environment, the budget of the participant, the promotion of different payment instruments and time pressure to make the payment. The neuro-scientific study is based on the analysis of brain scans as participants watched videos of cash and card transactions. The scientists observed which part of the brain was stimulated and deduced the emotional perceptions associated with making payments by cash or card.

The authors draw two main conclusions from this research. The first is that the choice of a payment instrument is not driven by a conscious decision but largely by habit. Paying by cash or with a card is essentially part of one's automatic behaviour. This explains why it is so difficult to influence this choice. Secondly, paying with cash is associated with more positive emotions than paying with a card.

69 *Banknote design for the visually impaired*, Hans de Heij, DNB Occasional Studies - Vol 7 /N°2 (2009) [http://www.dnb.nl/binaries/Banknote%20design%20for%20the%20visually%20impaired\\_tcm46-224150.pdf](http://www.dnb.nl/binaries/Banknote%20design%20for%20the%20visually%20impaired_tcm46-224150.pdf)

70 *Making Bank Notes Accessible for Canadians Living with Blindness or Low Vision*, Carolyn Samuel, Currency Department. <http://www.bankofcanada.ca/wp-content/uploads/2011/08/samuel.pdf>

71 *Consumer Cash usage - A Cross-Country Comparison with Payment Diary Survey Data*, John Bagnall, David Bounie, Kim P. Huynh, Anneke Kosse, Tobias Schmidt, Scott Schuh and Helmut Stix in Working Paper n° 1685/ June 2014. European Central Bank. <http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1685.pdf>

72 *Flash Barometer 405 The Euro Area*, October 2014 TNS Political and Social

73 *The irrationality of payment behaviour*, Frank van der Horst and Ester Matthijssen - DNB Occasional Studies Vol. 11/N° 4 (2013)

## Costs of cash versus costs of electronic payment instruments

In 2005, the Dutch Central Bank published a paper aptly titled *Payments are no free lunch*<sup>74</sup>. The report measures the costs of payments, defined as the sum of all the internal costs borne by the relevant stakeholders in the payment value chain. The stakeholders are the central bank, the commercial banks, the retail industry and consumers. The report concludes that the total costs of payment systems are considerable. In the case of the Netherlands they represent:

- 0.65% of GDP or €2.9 billion;
- €0.35 per transaction;
- €400 per household.

The study also compares the variable costs of different payment instruments per transaction and finds that cash is cheaper than debit cards, credit cards and electronic wallets.

**Measuring the cost of payments is a complex task and results vary, depending on the market, the scope of the analysis and the methodology. However, the cost of cash remains the benchmark against which the efficiency of other instruments is measured.**

The cost of payments has also been researched by the central banks of Belgium, Finland, Germany, Hungary, Sweden and Australia. The results, summarised on page 55, differ from country to country depending on the mix of payment instruments, the efficiency of the economy and probably the methodology used to measure costs. However, the studies reach four common conclusions:

- There are significant costs involved with making payments. They vary from 0.12% of GDP in Finland to 0.99% in Hungary. In a separate paper<sup>75</sup>, the ECB has estimated that on average, the cost of payments is 1% of GDP (based on a sample of 13 EU countries). If we extrapolate this to the world, the overall global cost of

payments amounts to roughly \$760 billion, and this is probably a conservative estimate. In comparison, this exceeds the revenues of the airline industry, estimated at \$745 billion<sup>76</sup>.

- The cost of cash is in line with the share of cash as a payment instrument. In the ECB study, cash payments represent nearly half the total costs.
- Cash payments represent the lowest unit cost per transaction in all countries but Sweden and Australia.
- The structure of cash-related costs differs from that of electronic payments. The costs of electronic payments are essentially fixed as they are related to the infrastructure. On the other hand, cash-related costs are both fixed and variable. Items such as processing and transportation, as well as the opportunity cost of holding cash inventories, increase with the value of the transaction. As a result, cash is more cost-efficient for low-value transactions.

Malte Krüger and Frank Seitz<sup>77</sup> have undertaken a critical review of payment cost calculations and conclude that “Great uncertainty is attached to estimates of the costs associated with the payment system. Due to the many unique aspects of different countries, we would especially warn against attempts to apply the findings for one country to another without making adjustments.”

Cash is not always the most efficient payment instrument but in some cases it is. And this is particularly true for low-value transactions which represent the bulk of retail payments. In the case of the Netherlands, the cheapest instrument, irrespective of the transaction amount, was e-money<sup>78</sup> but the Dutch Chipknip scheme was abandoned in February 2015<sup>79</sup>.

The cost of a cash transaction remains a benchmark and is used to measure the efficiency of other payment methods. This is shown in the Merchant Indifference Test<sup>80</sup> (MIT), which is used, among others, by the European Commission to establish the level of Multilateral Interchange Fees applied by card schemes. This test ensures that merchants do not pay higher charges than the value of the transactional benefits from using cards. Merchants enjoy such transactional benefits if card payments reduce their cost relative to cash payments.



**The cost of a cash transaction remains a benchmark and is used to measure the efficiency of other payment methods.**



*The costs of payments in different markets*

	Cash	Debit cards	Credit cards	Total
<b>Dutch National Bank</b>				
Share of transactions by volume (%)	86	13	1	100
Share of transactions by value (%)	56	40	4	100
Cost per transaction in €	0.30	0.49	3.59	
Cost as % of GDP	0.48	0.11	0.04	0.65
<b>National Bank of Belgium</b>				
Share of transactions by volume (%)	84	15	1	100
Share of transactions by value (%)	61	35	4	100
Cost per transaction in €	0.53	0.55	2.63	
Cost as % of GDP	0.58	0.11	0.04	0.73
<b>Bank of Finland</b>				
Cost as % of GDP	0.12	0.12		0.24
<b>National Bank of Hungary*</b>				
Share of transactions by volume (%)	77	4	1	82
Share of transactions by value (%)	12	0	0	12
Cost per transaction in €	0.26	0.72	2.84	
Cost as % of GDP	0.8	0.12	0.07	0.99
<b>Central Bank of Sweden</b>				
Share of transactions by volume (%)	71	25	4	100
Share of transactions by value (%)	39	50	11	100
Cost per transaction in €	0.5	0.33	0.48	
Cost as % of GDP	0.3	0.08	0.02	0.4
<b>Reserve Bank of Australia</b>				
Share of transactions by volume (%)	77	11	12	100
Share of transactions by value (%)	48	26	26	100
Cost per transaction in €	0.34	0.41	0.74	

\* The Hungarian study includes other payment instruments such as credit transfers  
Source: *The Future of Cash™ 2012*, AGIS Consulting, September 2012

74 *Payments are no free lunch*, Hans Brits and Carlo Winder, DNB Occasional Studies Vol. 3 N° 2 (2005)

[http://www.dnb.nl/en/binaries/Occstud32%20web\\_tcm47-146645.pdf](http://www.dnb.nl/en/binaries/Occstud32%20web_tcm47-146645.pdf)

75 *The Social and Private Costs of Retail Payment Instruments A European Perspective*, Heiko Schmiedl, Gergana Kostova and Wiebe Ruttenberg - ECB Occasional paper Series N°137 September 2012

<https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp137.pdf>

76 IATA Financial Forecast March 2014. <http://www.iata.org/whatwedo/Documents/economics/IATA-economic-briefing-financial-forecast-March-2014.pdf>

77 Costs and Benefits of Cash and Cashless Payment Instruments - Overview and Initial Estimates, by Malte Krüger and Frank Seitz

78 *Payments are no free lunch*, Hans Brits and Carlo Winder, DNB Occasional Studies Vol. 3 N° 2 (2005)

[http://www.dnb.nl/en/binaries/Occstud32%20web\\_tcm47-146645.pdf](http://www.dnb.nl/en/binaries/Occstud32%20web_tcm47-146645.pdf)

79 <http://www.currence.nl/nieuws/dnb-memoreert-einde-chipknip/>

80 [http://ec.europa.eu/competition/sectors/financial\\_services/enforcement\\_en.html](http://ec.europa.eu/competition/sectors/financial_services/enforcement_en.html)

## Cash facilitates budgetary control

**Cash gives consumers better control of their budgets as they can actually see how much money they have. The pain of paying is more intense when cash is used and this encourages sound financial behaviour.**

Another distinctive feature of cash is that it is a real-time, ubiquitous budget-control instrument. A quick glance into the pocket or wallet immediately tells the consumer how much money is left. This is faster, easier and more efficient than any digital app.

This feature becomes essential in times of economic hardship. The recent global financial crisis has provided a clear illustration. In the US, between 2008 and 2009, consumers increased their use of cash and reduced their use of credit cards and, to a lesser extent, debit cards. In 2009, cash payments increased by 26.9% and cash holdings and monthly withdrawals also increased by 26.5% and 29.2% respectively. At the same time, credit card payments declined by 21.9% and debit card payments by 10%<sup>81</sup>. One explanation is that with the economic slowdown, people needed to keep better control of their budgets and reverted to a form of “envelope budgeting”, preparing separate envelopes for key expenses such as rent, food, school, electricity, etc.

Using data from Germany, von Kalckreuth, Schmidt and Stix<sup>82</sup> concluded that the need to monitor liquidity is an important reason for cash usage. Consumers who need to keep control over their budgets, and who have elevated costs of information processing and storage conduct a larger percentage of their payments using cash, hold fewer non-cash instruments, withdraw less often and hold larger cash balances than other consumers.

The idea that payment behaviour is influenced by the instrument used has been well documented in payments literature. The sensation of paying is more intense when cash is used and the transfer of banknotes can be visualised. Payment cards on the other hand, only require a signature or pin code and the impact is significantly less. Further, the migration to contactless payments has removed the need to enter a code or verify the amount. And with mobile payments, payers do not have to take out their wallet.

One report<sup>83</sup> even concludes that consumers are more likely to buy unhealthy food products when they pay by credit card than when they pay in cash. Indeed, the pain of paying in cash can curb impulse purchasing of unhealthy products.



*Use of payment instruments in a typical month in the US*

Number of transactions per consumer			
	2008	2009	Percentage change
Cash	14.5	18.4	+26.9
Debit card	21.2	19.0	-10.0
Credit card	14.4	11.2	-21.9
Cheque	10.0	8.7	-14.0
Others*	7.7	7.2	-6.4
<b>Total</b>	<b>67.4</b>	<b>64.5</b>	<b>-4.2</b>

\* Includes money orders, pre-paid cards, and electronic payments

Source: *The 2009 Survey of Consumer Payment Choice*, Kevin Foster, Erik Meijer, Scott Schuh and Michael A. Zabeck, Federal Reserve Bank of Boston Discussion Papers N° 11-1, April 2011



- 81 The 2009 Survey of Consumer Payment Choice, Kevin Foster, Erik Meijer, Scott Schuh and Michael A. Zabeck, Federal Reserve Bank of Boston Discussion Papers N° 11-1
- 82 Using cash to Monitor Liquidity. Implications for Payments, Currency Demand and Withdrawal Behaviour by Ulf von Kalckreuth, Tobias Schmidt and Helmut Stix. ECB Working Paper Series N° 1385 October 2011  
<https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1385.pdf>
- 83 *How Credit Card Payments Increase Unhealthy Food Purchases : Visceral Regulation of Vices*, by Manoj Thomas, Kalpesh Kaushik Desai and Sateeshkumar Seenivasan. Journal of Consumer Research Vol. 38 - June 2011  
<http://forum.johnson.cornell.edu/faculty/mthomas/VisceralRegulationofVices.pdf>







Innovative policies have increased efficiency in the cash cycle.

## Innovation contributes to the efficiency of cash

**Innovation has widely contributed to the efficiency of cash:**

- **Banknotes integrate state-of-the-art printing technology;**
- **Central banks have adapted their cash distribution models to increase the velocity of cash circulation;**
- **Technology has enabled banks to improve the efficiency of cash distribution.**

Modern banknotes and modern cash cycles have benefitted from significant levels of innovation in recent decades and this has increased the efficiency of cash.

Firstly, banknotes and coins incorporate state-of-the-art technology not only to stay ahead of counterfeiters but also to improve their durability. One example is the recent evolution in banknote substrates. Banknotes used to be printed on paper produced with natural fibres, essentially cotton. In the early 80s, various attempts to use substrates based on plastic met with only limited success, but in the late 80s, the Reserve Bank of Australia issued the first banknote on a polymer substrate. The original intention was to reduce counterfeiting but the new substrate also increased the lifecycle of the banknote. In 1996, all Australian notes were switched to polymer.

Following this radical change, manufacturers of paper substrates also turned their attention to making notes last longer. In the 1990s significant developments were achieved in the varnishing and coating of notes: the protective coating helped to reduce soiling while maintaining the traditional feel of paper notes. Another innovation was the embedding of synthetic fibres into paper

substrates in order to add strength and increase longevity. More recently, several manufacturers have launched “hybrid” substrates, combining layers of paper and polymer.

Secondly, central banks have adapted their cash distribution policies with a view to increasing the velocity of banknote circulation and the efficiency of the cash cycle. The optimal model depends on a number of national factors such as the maturity of the payment systems, the number of bank branches and ATMs, and the capabilities of central bank and commercial bank processing. In mature markets, as well as in some emerging countries, there has been a trend for central banks to delegate the processing of banknotes to commercial banks and other operators. This fosters a stronger cooperation between the key stakeholders in the cash supply chain. But it also requires central banks to increase their monitoring and supervisory role to ensure the quality and authenticity of cash in circulation, as illustrated by the ECB decision on the authenticity and fitness checking and recirculation of euro banknotes<sup>84</sup>. The regulation defines the standards for fitness sorting of notes, the procedures to be followed, and the reporting requirements for banks and commercial cash handlers.

Central banks have been elaborating innovative policies to increase the overall efficiency of the cash cycle. Examples include:

- The establishment of recirculation policies that define the standards and procedures for fitness sorting by commercial parties;
- A balance sheet relief mechanism to encourage the commercial sector to recirculate;
- Optimising cash inventories throughout the cash cycle.

Some central banks have introduced policies to promote the recirculation of banknotes outside central banks and compensate the cost of funding additional cash inventories with balance sheet relief. Some mechanisms, such as the Finnish DEPO scheme, are based on interest compensation; the Bank of Finland compensates private partners for a portion of their interest loss. Other countries, such as Australia, South Africa or the Netherlands, apply a Notes-Held-to-Order arrangement, where the central bank will credit the holder’s account without the cash being returned to the central bank<sup>85</sup>. It is worth noting that these models have a positive environmental impact as they reduce the need for transporting banknotes.

Banknote distribution has been the third area of innovation. The first ATM was deployed in London in 1967<sup>86</sup> and, according to Retail Banking Research, the installed base will treble from 1 million machines in 2000 to 3 million in 2015<sup>87</sup>. The total number of cash withdrawals is set to reach 103.2 billion in 2015 and the ATM has become the main distribution channel for cash in modern economies. Clearly, ATMs have played a major role in increasing the availability and efficiency of cash. Numerous studies have emphasised that ATM withdrawals are significantly cheaper than withdrawals at bank branches. In the US, the difference in cost is about 18%, indicating that technological improvements are an important factor in keeping the number of cash transactions relatively high<sup>88</sup>.

Numerous other innovations contribute to the efficiency of cash. In Kenya, M-Pesa (Pesa is Swahili for money) was launched in 2007 by Kenyan telecommunications provider Safaricom as a money transfer service, enabling users to send and receive money through their mobile phones. Today M-Pesa is the most developed mobile money system in the world and often recognised as one of the key innovations in payments of the last decade. While numerous features have been added to M-Pesa since its inception, it remains essentially a cash transfer system using a network of over 60,000 agents that constitutes a form of branchless banking. According to the World Bank<sup>89</sup>, in 2012, 21 million Kenyans made 527 million such transactions.

84 [https://www.ecb.europa.eu/ecb/legal/pdf/l\\_25320120920en00190031.pdf](https://www.ecb.europa.eu/ecb/legal/pdf/l_25320120920en00190031.pdf)

85 *The role of the central bank in the cash cycle*, by Miika Syrjänen and Kari Takala, Bank of Finland Bulletin 1 2010  
[http://www.suomenpankki.fi/en/setelit\\_ja\\_kolikot/rahahuolto/Documents/b\\_1\\_2010\\_RoleOfCentralBankCC.pdf](http://www.suomenpankki.fi/en/setelit_ja_kolikot/rahahuolto/Documents/b_1_2010_RoleOfCentralBankCC.pdf)

86 [http://news.bbc.co.uk/2/hi/uk\\_news/scotland/highlands\\_and\\_islands/8691747.stm](http://news.bbc.co.uk/2/hi/uk_news/scotland/highlands_and_islands/8691747.stm)

87 <https://www.atmia.com/files/Position%20Papers/Position%20Paper%20on%20Cash%20as%20Public%20Money%202014.pdf>

88 *This is What's in Your Wallet... and Here's How You Use It*, by Tamas Briglevis and Scott Schuh - Federal Reserve of Boston N° 14-5.  
<http://www.bostonfed.org/economic/wp/wp2014/wp1405.pdf>

89 *Kenya Economic Update - June 2013*. The World Bank  
<http://www.worldbank.org/content/dam/Worldbank/document/Africa/Kenya/kenya-economic-update-june-2013.pdf>



3.6

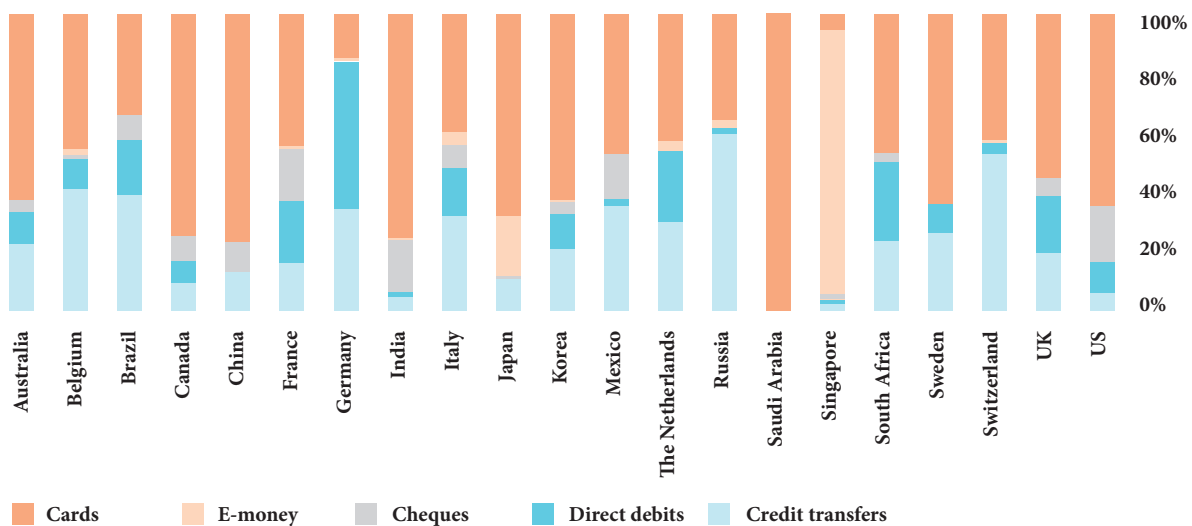
## Cash ensures competition among payment instruments

**Payments are a highly concentrated market and, with growing pressure on prices, operators seek to achieve economies of scale through consolidation.**

The payments market has experienced a high level of diversification in recent years with the emergence of new channels and instruments, particularly in online payments for e-commerce transactions and m-payments using mobile devices. However, debit and credit cards dominate the non-cash payments market.

According to the World Payments Report 2014<sup>90</sup>, the global volume of non-cash transactions reached 334.3 billion in 2012. Card transactions totalled 203.4 billion or 60.9% of the total (debit cards 42.1%, credit cards 18.8%). Cheque usage on the other hand, is declining in all countries.

*Relative importance of payment instruments in 2013  
(based on transactions volumes)*



Source: Bank for International Settlements, using 2013 data



Payments are a low-margin industry and operators compete for market share to achieve economies of scale. This has led to highly concentrated markets and high barriers to entry. In addition, the complex pricing structures that govern payments are essentially based on interchange fees, which tend to restrict competition. In 2008, Bradford and Hayashi<sup>91</sup> identified about 20 countries where public authorities have moved to limit the level of

interchange fees or merchant discount fees. This list has grown since.

An OECD report<sup>92</sup> concludes “there is no consensus among economists and policymakers on what constitutes an efficient fee structure for card-based payments, and it is not clear if payment competition might do the trick.” Cash ensures that there is competition among payment instruments.



90 *World Payments Report 2014*, Caggemini and RBS

91 *Developments in Interchange Fees in the United States and Abroad*, by Terri Bradford and Fumiko Hayashi, Federal Reserve Bank of Kansas City - April 2008 <https://www.kansascityfed.org/publicat/psr/briefings/psr-briefingApr08.pdf>

92 *Competition and Payment Systems 2012 - Policy Roundtables*, OECD - Directorate for Financial and Enterprise Affairs Competition Committee - 28 June 2013 <http://www.oecd.org/competition/PaymentSystems2012.pdf>



4.

# Cash connects people

**Cash contributes to social cohesion  
and constitutes the ultimate social network.**

**Money is a cultural instrument  
that conveys a message of unity for  
a political community,  
a symbol of national sovereignty.**

# Cash is a social network

In 1875, British economist William Stanley Jevons<sup>93</sup> demonstrated how money remedies the problem of the ‘double coincidence of wants’ which severely limits the bartering system: “The first difficulty in barter is to find two persons whose disposable possessions mutually suit each other’s wants. There may be many people wanting, and many possessing those things wanted; but to allow an act of barter, there must be a double coincidence, which will rarely happen.” In a barter economy, a transaction may occur when the supplier of goods A wants B and the supplier of goods B wants A. Money facilitates transactions as it provides more liquidity: the suppliers of goods A and B may sell to whoever and use the funds to purchase the product of their choice.

The concept of double coincidence of wants could also be extended to payment instruments. For two parties to agree to transact, they both need access to the same payment instrument. And the instrument used most widely is cash.

In fact, banknotes and coins have become a universal language. They enable people from different cultures and different societies to transact, to exchange goods and services and to communicate. Anywhere on the planet, the “meaning” of banknotes is understood, even between those who do not speak the same language.

Within the broad cash community, there are active and even passionate sub-communities. An internet search for “banknote collectors” yields 528,000 results. Other cash geeks include communities who monitor the circulation of banknotes by tracking the serial numbers. One popular site *www.wherisgeorge.com* follows US one dollar notes, which feature the portrait of George Washington. At the time of writing, the most popular note was spotted 15 times in just over three years, travelling 4,183 miles. Almost 250 million notes have been entered into the website. While this site was created essentially for fun, its data has been used by scientists to

draw conclusions about the statistics of human travel, independent of the means of transportation involved<sup>94</sup>. These models are used, for instance, to predict the geographical spread of epidemics.

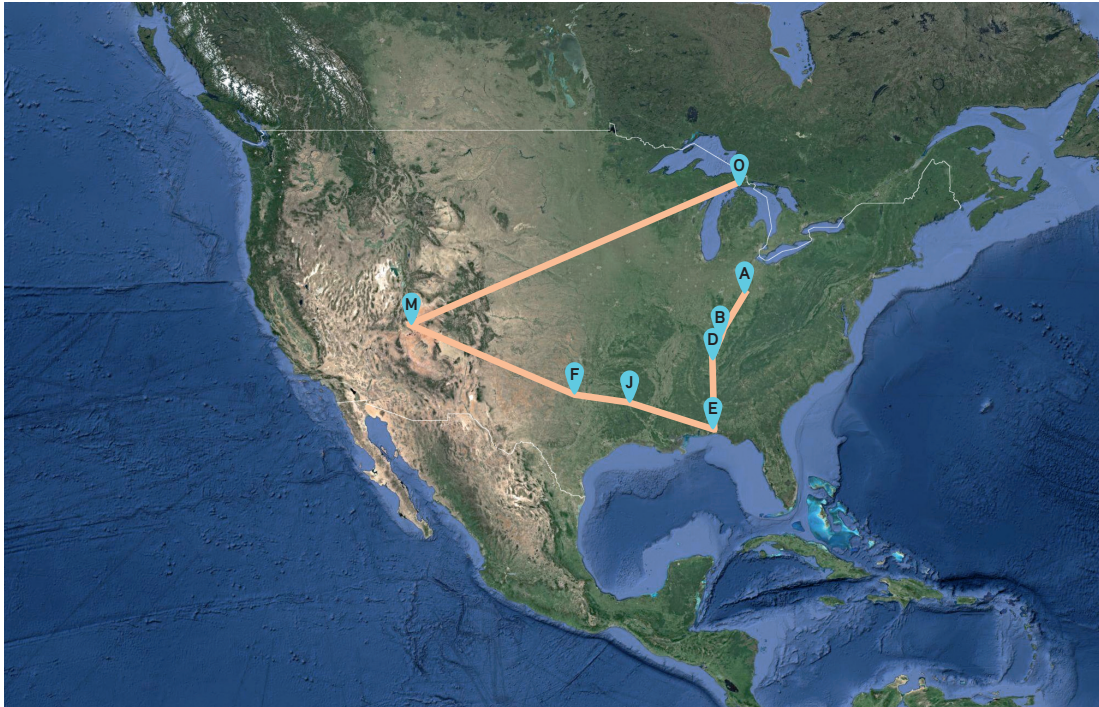
Cash also helps to create a form of social cohesion within society. The same notes and coins are used by all, young or old, rich or poor. In a way, cash creates a social network. And this is an open social network that does not require detailed sign-ups or any form of technology.

In 2002, the OECD brought together high-ranking government officials and business leaders in Luxembourg to debate the future of money. The conference had two key objectives: first to explore the relationships between new forms of money and technological, economic and social change, and second to consider the implications for leadership in the public and private sectors. The papers were published in *The Future of Money*<sup>95</sup>. In

the opening paper, Riel Miller, Wolfgang Michalski and Barrie Stevens warn of the social risks associated with new payment methods: “A profusion of new payment methods and issuers of money could have a perverse impact on social dynamism by further fragmenting and ghettoising certain communities and regions. More sophisticated and differentiated monies might be used to discriminate and reinforce the existing correlation between hierarchies of creditworthiness and social status. Under these circumstances there is the risk that the political legitimacy and ultimately the viability of the monetary space are called into question. Without careful attention to the governance of new transaction systems, there is an increased danger, already heightened by the social dislocation of a transition period, of a political backlash against changes which are seen as undermining cherished symbols, like the national currency, without sufficiently opening up new horizons.”

**Cash is used by all, young or old, rich or poor. It does not lead to discrimination as everyone uses the same notes and coins. Cash contributes to social cohesion and constitutes the ultimate social network.**

*The circulation of a US one dollar note*



Source: [www.wherisgeorge.com](http://www.wherisgeorge.com)

- 93 *Money and the Mechanism of Exchange*, by William Stanley Jevons - 1875 - D. Appleton and Co  
<http://www.econlib.org/library/YPDBooks/jevons/jvnMME3.html>
- 94 [http://www.eurekalert.org/pub\\_releases/2006-01/m-ttm012306.php](http://www.eurekalert.org/pub_releases/2006-01/m-ttm012306.php)
- 95 *The Future of Money*, OECD, 2002  
<http://www.oecd.org/sti/futures/35391062.pdf>

**The penetration of notes and coins is not measured, but it is likely that close to 100% of the population use banknotes at one stage or another.**



## Cash is the most widely used product

**It is estimated that between 500 and 700 billion notes are in circulation around the world.**

According to the World Health Organisation<sup>96</sup>, in 2012, 89% of the world's population had access to an improved drinking water source, compared with 76% in 1990; however, globally 1.8 billion people use a drinking water source that is contaminated leading to an estimated 500,000 deaths per year. As for electricity, the International Energy Agency World Energy Outlook<sup>97</sup> shows that nearly 1.3 billion people are without access to electricity. Regarding information and communication technologies, the International Telecommunications Union<sup>98</sup> estimates the penetration of fixed telephone subscriptions at 15.8 per 100 inhabitants and mobile-cellular subscriptions at 95.5% in 2014<sup>99</sup>.

The penetration of notes and coins is not measured, but it is likely that close to 100% of the population use banknotes at one stage or another. According to our estimates, there are between 500 and 700 billion notes in circulation around the world. This means that banknotes are probably the most-used product in the world. Depending on the conditions of circulation and the value of the banknote, its typical lifespan varies from one to five years. As a result, approximately 150 to 160 billion notes are printed every year to replace notes which are no longer fit for circulation and destroyed.

Some traditional societies continue to operate outside of a monetary system, but it appears that currency is used at least for transactions with the rest of the world. The Yucuna Indians in Colombia are an example. According to anthropologist Laurent Fontaine<sup>100</sup>, “Very rarely used in Yucuna traditional

exchanges, the Colombian currency is found in certain of their market transactions with Whites.”

One person who would be expected not to use cash is Ajaypal Banga, the CEO of MasterCard. According to Fortune<sup>101</sup>, as he was concluding a speech to his leadership team on the downside of cash, he was challenged to show how much cash he carried. He opened his wallet and pulled out \$2. The team laughed “What a cheap guy – he can't even tip the bellboy.”

96 <http://www.who.int/mediacentre/factsheets/fs391/en/>

97 <http://www.worldenergyoutlook.org/resources/energydevelopment/>

98 ITU (International Telecommunication Union) is the United Nations specialised agency for information and communication technologies – ICTs. <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

99 <http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2014.aspx>

100 *Currency, One Mode of Exchange among Others among the Yucuna Indians of Colombian Amazonia*, by Laurent Fontaine, Journal des Anthropologues, 2002. <http://jda.revues.org/2254>

101 <http://fortune.com/2014/07/24/mastercard-tech-company/>

## Cash is a symbol of national sovereignty

**Because citizens come into contact with banknotes and coins every day, they see them as a symbol of national sovereignty. Money is a cultural instrument that conveys a message of unity for a political community.**

Banknotes circulate among large numbers of people and over vast geographical areas. As a result, they are often used to promote the country they represent and its values. Significant efforts go into a banknote design, involving experts in fields as diverse as history, sociology, psychology, and graphic arts to best reflect the country it represents. Banknotes tell a story about a country's heritage.

The design of the euro notes proved a particular challenge as they represent not one, but twelve countries when the euro was launched, 19 today and potentially more. Antti Heinonen, former Director of Banknotes at the European Central Bank recalls the process<sup>102</sup>: “Although most member states had a tradition of placing portraits of famous people on their currency, the banknote working group felt that this suffered the serious defect of an inevitable national bias.” One alternative was to display portraits of ordinary men and women across the ages, taken from European paintings and drawings. “The majority of the team feared, however, that it would be difficult to find pictures that would always remain nameless, that would be aesthetically pleasing and that would represent the genders and different nationalities

in a balanced way. There was always the possibility that a portrait would be identified and associated with some region or country on the basis of its features, decoration style and location.” The winning design, created by Robert Kalina from the printing works of the Austrian Central Bank, features bridges, arches and gateways in different architectural styles. The design was then modified to ensure that these architectural features do not represent existing monuments.

Besides picturing the country's heritage and values, currency also plays a strategic role in economic terms: it provides a domestic payment system. There are numerous examples where payment cards are not accepted in a country due to political tensions. In Cuba for instance, credit cards issued by US banks are not accepted though this may evolve as diplomatic relations between the two countries improve.

A currency also reflects the strength and various aspects of the economy. The international circulation of a currency illustrates the international or regional influence of the country.

Lastly, numerous jobs depend on cash. The production, issue, distribution and sorting of notes and coins are all labour-intensive activities.

102 *The First Euros*, by Antti Heinonen, Suomen Pankki and the European Central Bank, 2015





Banknotes tell a story about a country's heritage.  
Independence Hall, Philadelphia, US.

4.4

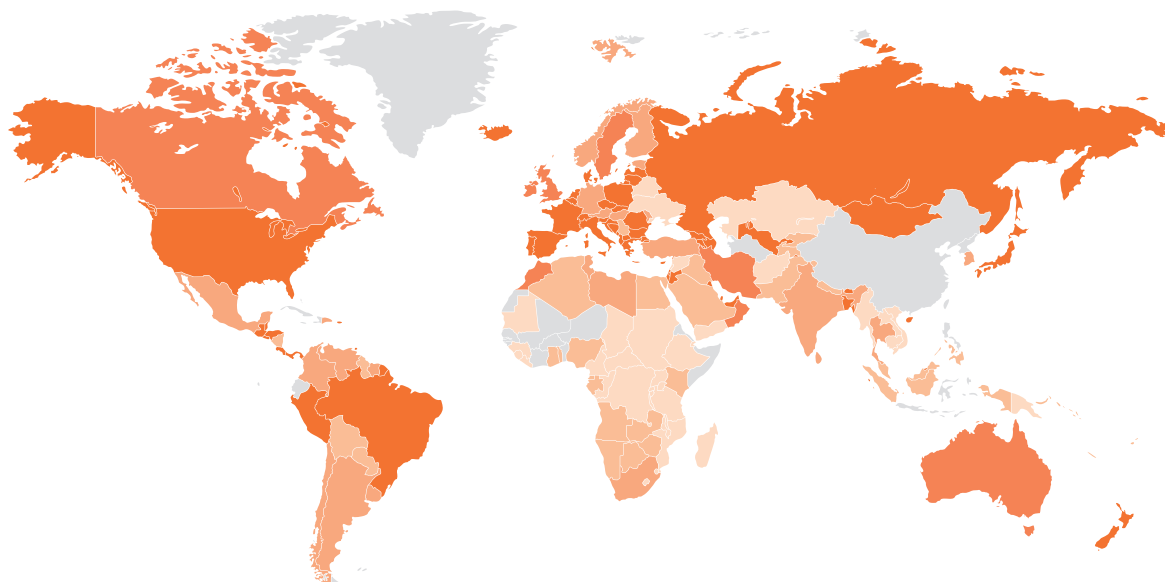
## Cash is the first step of financial inclusion

**For the unbanked, which represent half of the world population, access to cash is the first form of financial inclusion.**

Nearly half of all adults in the world are excluded from formal financial services; that is 2.5 billion persons<sup>103</sup>. The vast majority live in developing or emerging economies and can represent 90% of the population in some countries. Even in some advanced economies the number of unbanked can be as high as 20%. In the US, the Federal Deposit Insurance Corporation<sup>104</sup> estimates that 7.7% of households were unbanked in 2013 and 20% were under-banked, meaning that they hold a bank account but do not have full access to banking services.

According to the World Bank<sup>105</sup>, lack of money is the most frequently cited reason for not holding an account. Distance and documentation are also significant obstacles. Often, the main barrier to account penetration in rural areas is the large distance to a bank branch. Other barriers include stringent “Know Your Customer” regulations that banks are required to comply with as well as guidelines on combating money laundering and the financing of terrorism. These can prevent poor households from entering the financial system.

*Commercial bank branch penetration and financial inclusion*



Indicator: Commercial bank branches (per 100,000 adults)  
Year: 2011

no data   0-4.39   4.39-10.6   10.6-19.0   19.0-30.7   30.7-127

Source: The World Bank, 2015

Central banks and regulators have taken a variety of measures to foster financial inclusion<sup>106</sup>. Some countries, such as India, have encouraged the expansion of bank branches and ATM networks; the number of ATMs in India has been growing at a compound annual rate of 24% since 2010 and is expected to reach 175,000 in 2015. Many others, including Brazil, Colombia and Peru, have promoted “branchless banking” meaning the delivery of financial services outside of conventional bank branches.

The third lever for increasing financial inclusion is innovation, as illustrated by the development of M-Pesa in East Africa. M-Pesa was launched in 2007 in Kenya. According to the Central Bank of Kenya 2014 Annual Report<sup>107</sup>, in June 2013 there were 120,781 mobile money agents, with M-Pesa accounting for 66.43%. This figure far exceeds the country’s 26,750 bank agents.

Greater financial inclusion not only requires an increased network for depositing and withdrawing cash – bank branches, ATMs, micro-finance institutions –

but also instruments to transfer cash faster and cheaper, including mobile devices. This increases the demand for cash and raises the velocity of banknote circulation.

The Financial Sector Deepening Trust of Tanzania (FSDT) has completed a census of cash outlets in the country, where basic “cash in/cash out” transactions can be conducted<sup>108</sup>. M-Pesa agents number almost 17,000 and account for 87% of all cash outlets commonly used for financial services or money transfers. (Data on the agents of other mobile money systems was not available.) MFI (Micro-Finance Institution) branches are the second largest type of outlets, with almost 1,100 points across the country. Commercial banks have almost 500 branches and an additional 369 stand-alone ATMs. Traditional money transfers are made at over 400 bus stands and 200 post offices.

103 United Nations Capital Development Fund  
<http://www.unctd.org/en/our-approach-if>

104 2013 FDIC National Survey of Unbanked and Underbanked Households  
<https://www.fdic.gov/householdsurvey/>

105 *Financial Inclusion in Africa - An Overview*, by Asli Demirgüç-Kunt and Leora Klapper. Policy Research Working Paper 6088 - June 2012

106 *Financial inclusion - issues for central banks*, by Aaron Mehrotra and James Yetman, BIS Quarterly Review 2015  
[http://www.bis.org/publ/qtrpdf/r\\_qt1503h.pdf](http://www.bis.org/publ/qtrpdf/r_qt1503h.pdf)

107 Central Bank of Kenya 2014 Annual Report <https://www.centralbank.go.ke/images/docs/CBKAnnualReports/AR2013.pdf>

108 *Where's The cash? The Geography of Cash Points in Tanzania*, by Ignacio Mas and Agathamari John, CGAP, 28 February 2013  
<http://www.cgap.org/blog/geography-cash-points-tanzania>

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益榮

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建統隆昌大

大利行



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海 水 鮮  
鮮 水 產 魚

肉 食





**Pocket money is a form of financial literacy. By the age of three or four, most children understand that money can be used to buy things.**

## Cash contributes to education

**Cash plays a key role in building a price reference. Cash is also an important educational tool. Many children around the globe do their first arithmetic by counting notes and coins.**

For economists, money is defined by three key functions: a medium of exchange, a store of value and a unit of account. As a unit of account, money serves to measure the value of goods and services. Cash plays a key role in building a price reference: banknotes and coins help to visualise a price expressed in abstract numbers.

Banknotes and coins also contribute to the education of children. All over the world; children learn to count and solve arithmetic problems with banknotes and coins as their first steps in financial education. In many countries, central banks contribute to this effort; the Reserve Bank of India, for instance, has dedicated part of its website to a Financial Literacy Project<sup>109</sup>. The objective is to explain the role of the central bank and general banking concepts to various target groups including children and college students, women, defence personnel, senior citizens and the poor in both urban and rural areas.

Numerous board games use facsimile banknotes which children spend to make their first transactions. Among them *Monopoly* is celebrating its 80th anniversary in 2015 by randomly replacing the facsimile

notes with real notes for some lucky customers<sup>110</sup>. Pocket money is another form of financial literacy. By the age of three or four, most children understand that money can be used to buy things they want.

Banknotes are designed with art and symbols that represent their country. For many people, they constitute a cultural and historical experience. One of the most widely viewed portraits in the world is that of George Washington painted by Gilbert Stuart and reproduced on the US one dollar note<sup>111</sup>. From January 1999 to November 2008, the United States Mint ran the “50 States Quarters Program” and annually issued five commemorative quarters with designs emblematic of a state on the reverse. These coins educated millions about the history, culture and geography of each state. They encouraged a generation of Americans to examine the coins in their pocket and revived the hobby of coin collecting. The program also generated great public interest as millions of citizens participated in their state’s design-selection process or attended the launch of their state’s new quarter.

Because coins are made in metals, they last for ages and provide clues about the place and period in which they were minted. Most written records from the ancient world have been lost or destroyed, but because coins are produced in large numbers, some survive where other evidence may not. Indeed, sometimes they are the only evidence that remains and provide important information for historians and archaeologists.

109 <http://rbi.org.in/financialeducation/home.aspx>

110 [http://www.lepoint.fr/societe/monopoly-gagnez-de-vrais-euros-02-02-2015-1901595\\_23.php](http://www.lepoint.fr/societe/monopoly-gagnez-de-vrais-euros-02-02-2015-1901595_23.php)

111 <http://thewestologist.com/2014/01/>





# Conclusion

In recent years, the diversification of payment instruments has accelerated. Technology has enabled the development of new equipment including contactless cards, mobile phones, tablets, smart watches and biometric devices. Deregulation has allowed non-banks into the payments market, which has been a banking prerogative for centuries. New entrants include the GAFAs – Google, Amazon, Facebook and Apple – which have all taken a strong interest in payments but with different levels of success. Telcos, transit companies and retailers have also tried to position themselves in this growing market. Business models have evolved and led to the emergence of alternative forms of money, including loyalty points and virtual currencies.

Despite this disruptive evolution, the demand for banknotes and coins has continued to grow at a significant pace around the world. As a payment instrument, cash retains a dominant role in the vast majority of countries.

In this white paper, we have shown how the strength of cash is based on a broad range of attributes rather than one or two unique aspects. Indeed, in early economic texts, the functions of money were summarised in a simple rhyme: “Money is a matter of functions four, a medium, a measure, a standard, a store.”

However, currency, which is defined by economists as “narrow money” has additional merits. Its universal acceptance, its ease of use, its contingency role and its educational role all help to create the sustained demand for notes and coins. Although several alternative payment instruments can match one or two attributes of cash, none can offer its full range of benefits.



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