

Want to know the future of cash
and how it can be cost-effectively handled?

YES



Inside the cash cycle

Insights into the logistics that support the world's
most preferred payment mechanism

An NCR White Paper in association with Paul Blond, Managing Partner,
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Cash remains the most preferred means of consumer payment

Set against an ever increasing array of payment mechanisms ranging from paper checks to the latest mobile device based payment solutions, cash - banknotes and coin – remains the world's most frequently used means of consumer payment.

Uniquely cash provides anonymity of use, requires no enabling technology or infrastructure to complete the transaction and does not require the user to have an established relationship with a financial institution or transaction provider. Given that half the world's adults (2.5 billion people) are without access to formal financial services cash is often the only means of settlement available. Research from the Financial Access Initiative (www.financialaccess.org) identifies countries such as China with 58% of the adult population unbanked. Even in highly developed countries such as the United Kingdom and United States an estimated 9% of adults do not have access to financial institutions and are thus routinely excluded from other non cash payment methods.

The enduring popularity of cash is in part illustrated by the continued year on year growth of currency in circulation. Globally it is estimated to now exceed the equivalent of USD \$4 trillion on issue, a four-fold increase in the past 20 years.

The ready availability of cash depends upon a complex supply chain

For the consumer, the ready availability of cash is largely a given. Indeed in times of adversity – for example natural disasters like Hurricane Katrina or the global economic crises of late – people turn to physical currency as a safe store of value, a means of transaction that does not require working infrastructure - be that financial institutions, electricity or communication supplies - and often also as a budgetary tool to help manage household finances.

The provision of currency is dependent on a highly complex supply chain both providing new and fit currency for withdrawal (the manufacturing supply chain), but also for the collection of deposits and surplus currency, in technical terms referred to as Reverse Supply Logistics. The cash cycle is in effect a Closed Loop Supply Chain on a vast scale.

For most currencies, travel money needs and physical foreign exchange activity aside, a country's currency circulates at a domestic level, but for major international currencies such as the Euro and United States Dollar the movement of money and the closed loop supply chain is truly global.



For example the United States Federal Reserve estimates that more than half of the USD \$900 billion in circulation is held outside the U.S. and over time the Central Bank has established a network of overseas Extended Custodial Inventories to work with commercial banks and currency traders to effectively supply, collect and recycle dollars on a worldwide scale.

The Federal Reserve demonstrates that the Central Bank is at the heart of a country's cash supply chain. Holding unique responsibilities for the smooth and efficient provision of payments in almost all cases, the Central Bank is solely responsible for the issue of new currency into circulation and the eventual authentication and destruction of unfit currency once it has reached the end of its useful life.

While traditionally a country's Central Bank has taken an active role in the day to day recirculation and recycling of currency - ensuring that banknotes and coins are reused many times before eventual destruction - today many institutions have delegated much of the currency distribution and recycling to the commercial sector. Despite this shift in physical cash handling Central Banks everywhere continue to play an active role in overseeing the integrity and quality of money in circulation.



The Automated Teller Machine – easier access to currency, but added supply chain complexities

The introduction of the Automated Teller Machine (ATM) 40 years ago has not only contributed to the rapid rise of currency in circulation, has helped to provide improved customer access to cash where and when required, but this has also dramatically added to the complexities of the supply chain, often creating separate supply lines and stocks of ATM and non ATM currency. With more than 2 million ATMs globally and continued growth in machine numbers (especially in some developing economies) there remains considerable scope to optimize this key transaction channel.

In particular the growth of ATMs located at off bank branch premises - such as in shopping centers and service stations - has often led to the development of separate supply arrangements with cash in transit and cash logistics companies providing cassette packing, cash replenishment and unused cash collection services often independent of the established branch cash delivery and collection arrangements.

Across the developed world how the public gets and uses the cash it needs has changed dramatically in the last 40 years. Once upon a time wages were routinely paid in cash, indeed in the United Kingdom until 1991 by law employees had the right to insist on cash pay packets and just 10 years ago more than 12% of British works still received a weekly cash pay packet. Most social security and welfare payments were also cash based – in 1999 87% of U.K. state pensions were paid in cash - and most other cash needs were obtained across a bank counter. In turn cash was typically spent on goods and services in one of the tens of thousands of specialist, usually local, retail stores in towns and villages across the country.

Most cash today - 85% of all withdrawals in the United Kingdom - according to U.K. Payments Administration (www.ukpayments.org.uk) - compared to 62% of all withdrawals in 1999 - is obtained from ATMs. Most social security payments are made electronically (98% all U.K. pensions compared to only 15% in 1999) with subsequent ATM withdrawal instead of at the Post Office or branch counter increasingly the norm. With many retailers offering debit card cash back facilities at the point of sale, U.K. personal check, passbook and across the branch counter withdrawals have declined from 36% of all withdrawals in 1999 to just 13% today. The statistics in many other countries show similar trends.

Returning to practical considerations, with the advent of the ATM came the need to provide high quality banknotes to minimize the risk of dispense mechanism jams and consequent machine downtime.

While today's ATMs are much more note quality tolerant and less likely to jam, the need and convention to sort and supply good fit quality counterfeit free banknotes remains. As the principal source of cash and one of the most frequently used touch-points for the customer, the ATM channel and the quality of cash dispensed are important ambassadors for the financial institution's brand and brand integrity.

Changes not only in the way we obtain, but also spend our money impact the supply chain

The closure of many corner shops and 'Mom and Pop' stores and the emergence of much larger supermarkets and hypermarkets have had a profound impact on how we spend our money. For many the convenience of a single visit to the supermarket has replaced the need to visit separate smaller outlets such as the butcher, baker or grocery store. As a consequence, in many countries such as the United Kingdom, retail spending is now concentrated in just a few very large retailers. British

multiple grocery retailers like Tesco, Sainsbury's and ASDA account for just 4% of the 90,000+ grocery outlets by number, but their sales represent more than 60% of the total. Globally, organizations such as Wal-Mart, Carrefour and Germany's Metro highlight the dominance of a few major retail chains concentrating consumer spending and as a consequence, retail cash takings.

Whereas once it was usual for the high street retailer to deposit their daily takings at the local bank branch providing a ready local supply of cash to fund subsequent withdrawals, the much larger cash takings from a supermarket store are invariably collected by a cash in transit (CIT) company. Today cash deposits are far more likely to be counted, often with sophisticated cash handling equipment, in a large regional cash processing centre rather than over a branch counter.

Even where merchant cash deposits are taken directly to a bank branch, in many cases the retail counter simply serves as a bag drop off point with the commercial deposits and perhaps night safe and deposits from other automated devices being transported to a secure cash centre for subsequent processing. These initiatives, often underpinned by arrangements for transaction handling between the personal and business customer divisions of a bank, have certainly freed up teller time to devote to other customer facing activities, but as a consequence the level of cash deposited and immediately available for reuse within the local bank is often greatly diminished.

These changes in how we obtain and spend money, replicated in many countries around the world, have profound implications for the cash supply chain and in particular the location and scale of cash supply and demand.



The changing role of the Central Bank

As currency in circulation has risen and the demand for ATM quality currency has grown many Central Banks have been faced with the challenge of either increasing new note (and coin) production, enhancing their own cash sorting capacity or have had to find alternative ways to manage currency supply.

Early Central Bank proponents of delegating cash handling to the commercial sector such as the Bank of England and Reserve Bank of Australia have been followed by others such as the U.S. Federal Reserve and Dutch National Bank. In the United Kingdom the Bank of England has closed all but two of its branches (retaining facilities in London and Leeds), imposed and subsequently updated rules for the withdrawal and return of notes from the Central Bank and introduced financial incentives to part compensate commercial cash processors for the additional storage of surplus cash that can no longer be returned to the Central Bank.

Given the need for greater commercial sector holding and recirculation of currency, the need to support the growth of ATM networks and the consolidation of retail takings into fewer but much larger deposits a number of large highly automated cash centers have been established.

After much analysis and industry consultation the U.S. Federal Reserve introduced a countrywide cash recirculation policy in July 2007. New rules were introduced to minimize the level of \$10 and \$20 bills cross shipped – that is deposited and subsequently withdrawn by the same institution in the same time period within a given geography. These rules and the Federal Reserve's own compensatory arrangements has led to a more than 40% fall in the level of currency being sorted and recycled at the Central Bank. In the Netherlands the Dutch National Bank through its own initiatives and the closure of its regional branches, has reduced its annual note sorting activity from a peak in 2004 of 1.8 billion pieces to just 700 million notes in 2009. An updated Cash Distribution Agreement will see the Dutch National Bank reduce its note sorting levels

even further with the eventual aim of handling only unfit and redundant notes. With the intent of reducing society wide cash handling inefficiencies these initiatives have had much success in reducing unnecessary cash processing but not without considerably increasing the burden on commercial cash handlers.

Note quality and counterfeit risks remain paramount concerns for Central Bank regulators

Looking to future trends, Central Banks will continue to delegate and in many cases increase the outsourcing of routine cash processing to the commercial sector, but still will want to retain close oversight of quality of currency in circulation.

Both note quality and the need to ensure that their currency is counterfeit free remain primary concerns for Central Banks, even those that have already delegated much of the day to day processing to the commercial sector.

A closed loop, where currency only circulates in the commercial sector has the potential to disintermediate the Central Bank and without adequate oversight may lead to note quality degradation and a growth in counterfeit levels. While counterfeit levels remain low compared to other fraudulent activity such as check and card fraud, regulators remain vigilant to the risks.

One consequence of the need to combat banknote forgeries from both professional counterfeiters and amateurs with access to low cost digital reproduction technology, is the increased frequency of note series replacements and the regular upgrade in note security features. For example in 1996 the U.S. Federal Reserve made the first significant changes to dollar bills in 67 years. Just 7 years later in 2003 the Bank embarked on another redesign progressively introducing color into the U.S. currency.

Currency design updates and the need to segregate and retire old series notes from the cash supply cycle will remain ongoing tasks around the world as issuers seek to preserve the integrity of their currency.

The cost of cash

Much has recently been debated as to the cost of cash and how cash is expensive compared to other payment methods. While arguments can be made to question this assertion one common agreement is that most financial institutions and other cash handlers view reducing the cost of cash handling and improving cash management efficiency as business imperatives.

Calculating the total cost of cash is often complex and includes an assessment of the currency supply/funding costs, secure transportation, safe storage costs and the balance sheet costs of holding currency on the bank's books. In most countries the current historically low interest rate environment ensures holding costs are minimal while high transportation costs are probably the most obvious and immediate target for cost reduction.

Accordingly, while there is a timely case to be made for holding higher cash balances, increasing localized cash recycling and reducing transportation it is however important to remember that a rise in interest rates back to more typical levels may radically change the cost calculations and business case. For example while the current U.S. Fed Funds rate is less than 1% a return to historical average rates would see at least a four or five fold increase in the cost of cash holding. Sophisticated cash modeling software tools and accurate data analysis is required to optimise the balance between transportation and holding costs and requires close and strong relationships with a bank's cash in transit supplier to be able to respond rapidly to changing delivery and collection schedules.

Localized cash recycling

Where once upon a time cash withdrawals and deposits revolved around a bank's branch counter as we have already discussed, the advent of the ATM, the proliferation of remote site ATM locations and the consolidation and concentration of retail spending at fewer larger retailers has conspired to dramatically

alter the balance between cash supply and demand. The ability to match cash withdrawals and deposits not only in aggregate, but in the required denominations and fitness qualities, without the undue cost and security risk of holding large reserve stocks on premises, is greatly reduced and likely to be achieved only in a few locations that are broadly cash neutral, typically only a small percentage of a bank's entire branch network.

While a closed community location, such as perhaps at an airport, on a military base or where there is a small parade of shops with a community bank and a few local retailers, might make for an excellent self contained cash recycling environment the need to maintain banknote fitness standards, support Central Bank oversight requirements and be able to introduce new note designs and retire older ones will still require some frequency of external intervention in the supply chain.

A place for recycling ATMs and branch teller cash recyclers

Clearly there is a place for installing recycling ATMs and branch teller cash recyclers as these offer convenient ways to securely handle routine cash transactions and free up branch staff to provide other customer services. Such devices offer the ability to reduce some, but rarely all, of the withdrawal or deposit demand that would otherwise need to be delivered to or collected from a bank branch by secure cash in transit. Invariably recycling across all denominations and note qualities can rarely be achieved consistently with perhaps the need to order in additional supplies of the preferred ATM dispense denomination or the need to return high value or unfit notes still necessitating cash in transit services. Maximizing the opportunity to recycle locally and reduce unnecessary transportation relies in part on the automation technology available, but more so on access to sophisticated cash management software that can analyze and forecast cash withdrawal and deposit activity and so best optimize any mismatch in supply and demand.

Looking to the future, possibly a less cash, but certainly not cashless world

While many commentators have predicted the demise of cash, the continued growth of currency in circulation and expansion of ATM networks around the world dispels many of these forecasts.

That said, some data indicators show the slowing of demand for cash and a newer generation of consumers with reduced reliance on banknotes and coin. Where payment alternatives do exist and critically provided they are widely accessible and affordable to the public, these alternatives are likely to grow in popularity. Stored payment cards such as the London Transport Oyster card or internet and mobile commerce payment initiatives such as the M-PESA mobile money transfer service are good examples of new payment methods that are gaining widespread popularity.

Growth is likely to come in part at the expense of cash usage, but also as a substitute for other payment methods such as checks and credit cards. Reinforcing the opening observation that half the world's population is unbanked and the unique and enduring properties of cash even at reduced levels of use, cash will remain a globally preferred means of consumer payment for many years to come.

With a strong future for cash, cost-effective cash handling will remain a priority. Given the many variables in terms of cash supply and holding costs we see a flexible and responsive approach to cash supply chain management, underpinned by the deployment of sophisticated cash management software that can dynamically optimize holding or moving cash stocks in response to fluctuating interest rates, transportation and other costs.

For some organizations driving cash transactions and cash processing out of the branch to other payment methods, delivery channels and centralized processing locations will remain a priority. For others, particularly where cash supply and demand is more balanced in a given locality, cash recycling will grow in importance and offers a way of driving increased efficiencies in cash handling.

Alongside the now near ubiquitous ATM other enabling technologies such as recycling ATMs, intelligent deposit devices and teller cash recycling devices will all play their part in automating routine cash handling and continue to provide more cost-effective access to satisfy the public's insatiable demand for cash.



About the Author

Based in the United Kingdom and Australia Paul Blond is a leading international authority on physical cash management, cash handling practices and cash supply chain logistics. With twenty five years consulting experience Paul has worked with more than fifty different Central Banks, Banking Associations, Commercial Banks, Cash Logistics companies and other cash handlers in over thirty countries worldwide.

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