CASH 4.0 – The Evolution of the Cash Cycle

GLORY has been involved in the cash cycle for over 100 years. During this time we have witnessed much change, and the pace of this change has accelerated significantly over the past twenty years. That said, what we have seen so far is nothing compared to the game changing disruption that is to come.

So where are we now, and how is the situation likely to change?

This white paper will take us on a journey through the cash cycle, from the past to the present and will show us a glimpse of how the cash cycle could evolve.

Let's start our journey by jumping back 10,000 years, to the time when bartering was born.

HOW, WHEN AND WHY WAS CASH BORN?

The first forms of trade consisted of the exchange of products. For example, we agree that I will give you a jug of wine and you give me a fish. This is called "barter". But the problem is obvious: what if you want wine, but don't have a fish? And also, how many fish is a jug of wine worth? What was needed was a "reference product", a standard against which to agree the relative value of different good or services. Whilst gold wouldn't be used as widespread currency until 2,500 years later, Egypt used gold bars in set weights for exchanges. Around 3,100 BC, the Egyptian ruler Menes laid the foundation for incorporating gold into the Egyptian economy and decreed that "one part of gold is equal to two and one-half parts of silver in value". From there it was just a matter of evolution to coins, skins, and then on to paper money.

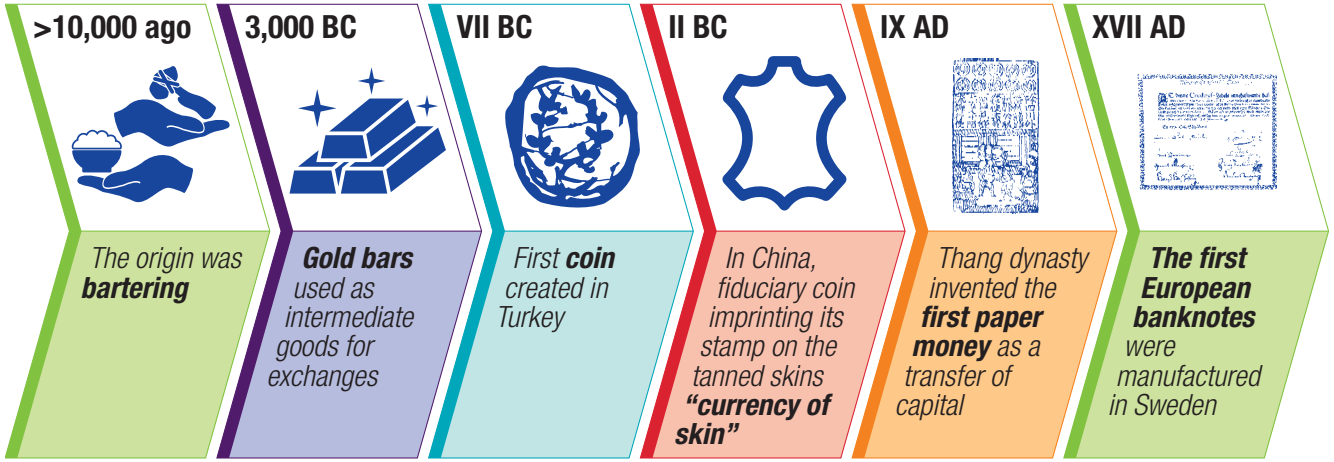
This was an incredible shift because, unlike gold or silver, it is just a piece of paper, with almost zero intrinsic value. But all of us trust that piece of paper and what it stands for. Even with all the innovations over the past 40 years, **paper currency is still considered one of the top innovations that changed history,** ranking number three, after the printing press and the compass.

HOW, WHEN AND WHY WAS CASH BORN? [continued]

And how many of these pieces of paper are there around the world? It's almost impossible for anyone to be certain, but estimates put the number around 500 billion – half a trillion. If you were to lay all of those banknotes out end to end, they would stretch nearly 2,000 times around the world.

That is a lot of banknotes changing hands every single second of every day. So, let's take a look at the secret life of all of those banknotes that are moving around the planet – the cash cycle.

This is the flow of physical currency – simple as that.

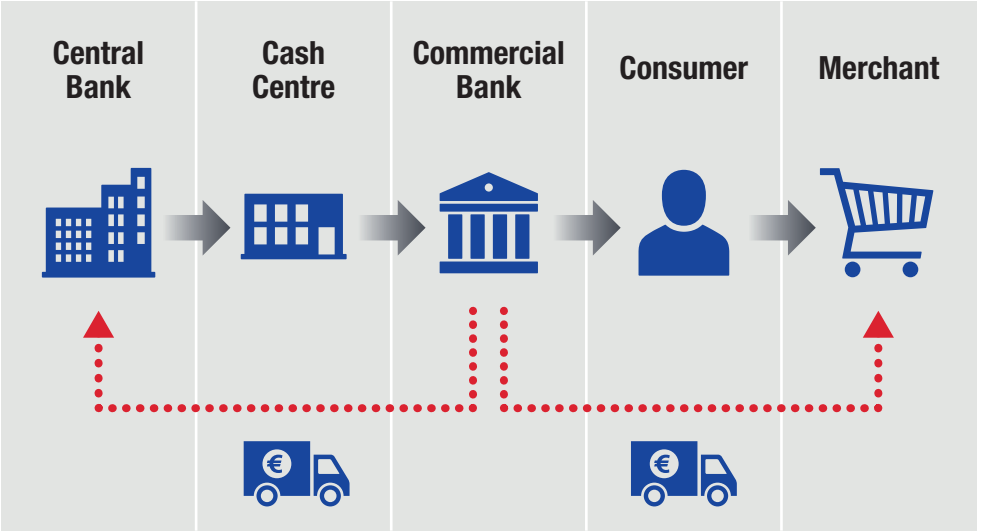


THE SECRET LIFE OF CASH
THE CASH CYCLE

What is the cash cycle and what does it do?

While cash as a medium of exchange has been around for over a thousand years, the cash cycle, whereby cash is distributed and managed in a well-structured marketplace, is a more recent innovation. It involves **five key players**: the central bank as the government issuer of cash, consumers and retailers as the primary users of currency, commercial banks as key distribution points and secure transportation companies to move cash from place to place. All 500 billion banknotes are moved around by these five key players to enable commerce in the modern world. On average, each note moves more than 200 times per year, but the frequency differs depending on the currency and the denomination. For instance, a British twenty-pound note is exchanged more than 2,000 times between being issued and withdrawn (with a lifespan of almost 10 years).

The key players have remained the same over time but the mechanisms by which the cash cycle operates have changed particularly over the past 50 years. So what have those changes been and how can we classify them?



"ON AVERAGE, EACH NOTE MOVES MORE THAN 200 TIMES PER YEAR."

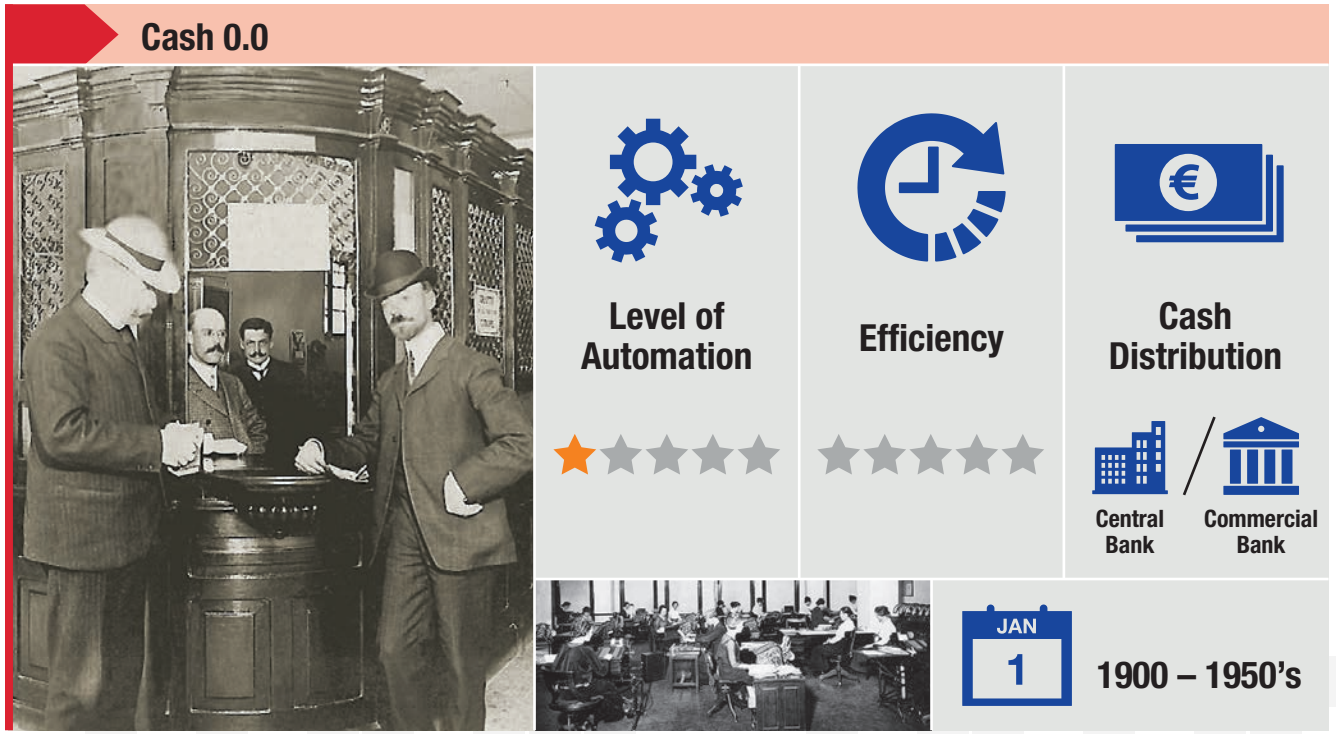
CASH CYCLE 0.0
A MANUAL APPROACH

The modern cash cycle begins

The cash cycle involves the flow of physical currency from the central bank through commercial banks to buyers and sellers and back to the central bank for replacement. Up until just over fifty years ago, cash was primarily processed manually and automation was limited.

For larger retailers, surplus cash was picked up by a Cash in Transit Company (CIT) and smaller companies typically had their staff take their cash directly to bank branches. In many countries cash had to be returned to the central bank for verification before it could be redistributed. At every point of exchange cash was counted manually, often by more than one party.

We can categorise this highly manual, inefficient mode of operation as Cash Cycle Version 0.0.



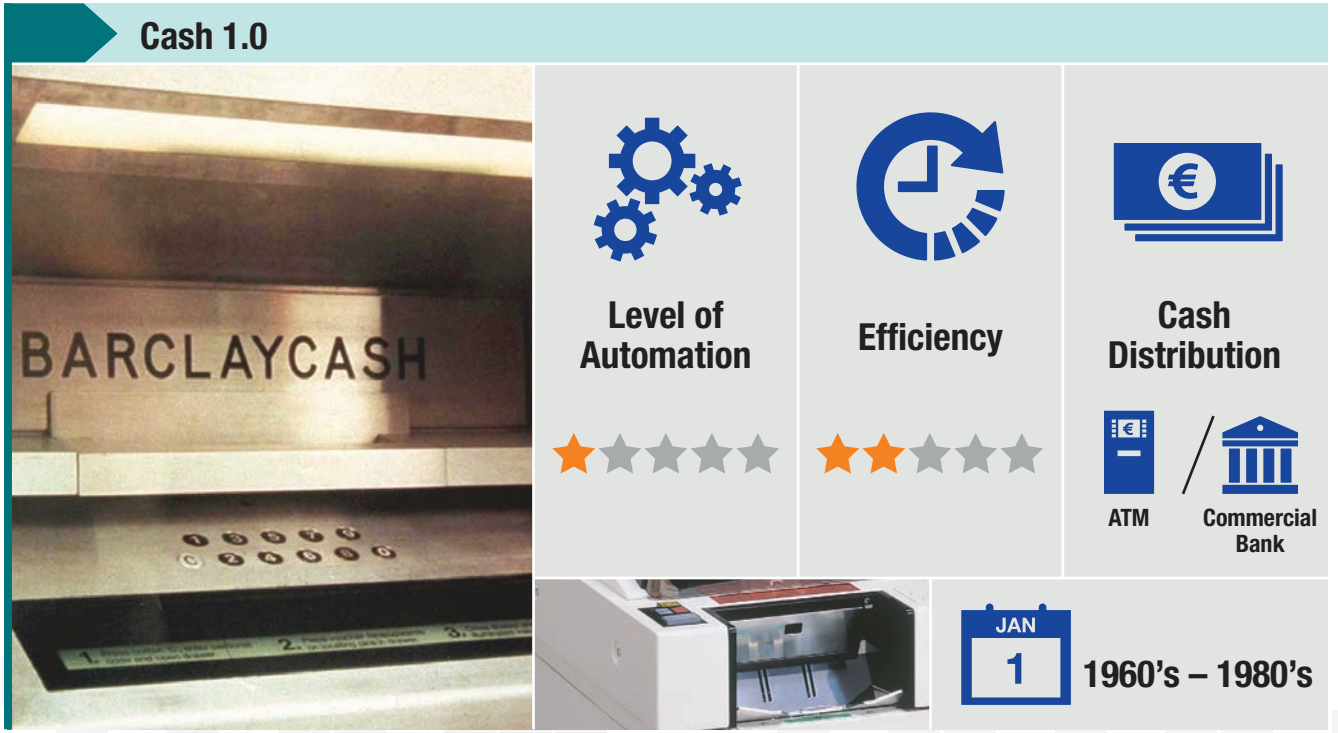
CASH CYCLE 1.0
BANKING CASH AUTOMATION BEGINS

Increased bank automation

A number of innovations between 50 and 20 years ago reduced and replaced many manual cash handling tasks in the banking industry. These included the introduction of ATMs, cash sorters at the banks' cash centres and Teller Cash Dispensers at bank branches. The result was a drastically reduced burden for bank staff who were handling cash. Though there was change in this area, interaction between retailers, CITs and banks remained largely unchanged. This period of rapid improvement in bank cash handling efficiency and security created the basis for fundamental changes in bank branch design and consumer-to-bank interactions that continue today.

Back-end technologies created the push for faster deposit recognition and acceleration of business banking services.

This period can be referred to as Cash Cycle version 1.0, and it lasted until around 20 years ago.

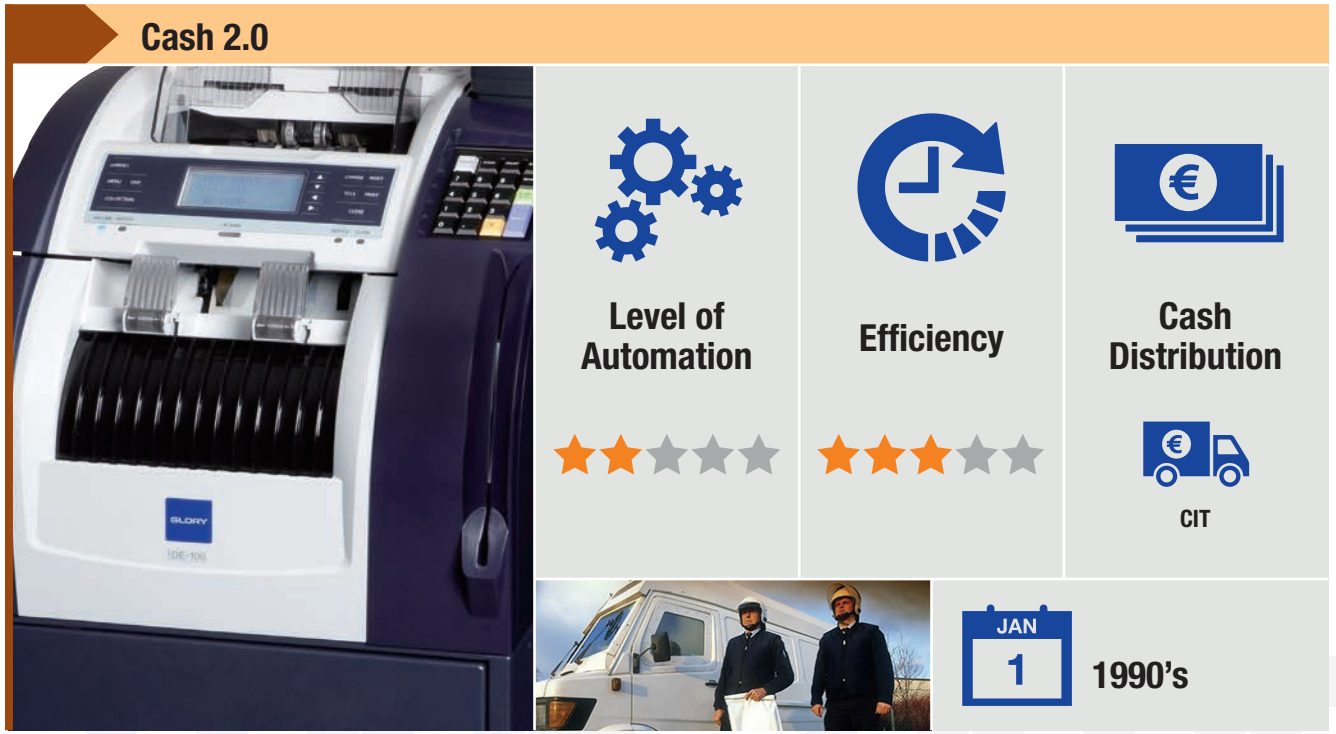


CASH CYCLE 2.0
A CHANGE IN FOCUS BY CITS

CIT business expansion

The move to what we are calling Cash Cycle 2.0 was driven by the CIT companies. The new CIT business model was focused on growth, which required gaining acceptance of services where previously business staff would self-deliver deposits to their local bank branch. CITs introduced a concept whereby the retailer could keep cash on-site securely for longer periods of time. The new concept reduced the need for frequent armoured car pickups and lowered the cost to the retailer. This new affordable option expanded the market for CIT's.

What made this all possible was a simple device – the "smart safe". CITs guaranteed that the contents of an on-site, secure cash counting safe would be deposited at the bank. And the result? Increased safety and deposit accuracy combined with reduced labour costs involved with trips to the bank.



CASH CYCLE 2.5
AND THE CONCEPT OF PROVISIONAL CREDIT

The benefits of Cash Cycle 2.0 were limited by the fact most retailers wanted cash in their bank accounts quickly in order to pay suppliers. The smart safe idea was significantly enhanced by improved communication technology through cooperation between CITs and key commercial banks. Deposit data could now be extracted remotely from smart safes and the resulting deposit data transferred to the bank. As CITs already guaranteed the physical delivery of cash deposits, the cash could be credited to retailer accounts prior to actual physical deposit at the bank. This effort was called provisional, or same-day credit and aligned well with other rapidly rising technologies for remote deposit check processing and verified credit payment terminals. Commercial deposit automation had fully arrived by the mid-2000s.

There was a curious downside to this change in process. Less urgency to deliver physical cash to the bank resulted in an increase in the amount of cash in circulation. Operational efficiency between banks and retailers had improved, and new revenue opportunities had been created for CITs, but the system overall was now becoming less 'cash efficient'.

Cash 2.5 – Provisional Credit Accelerating Cash

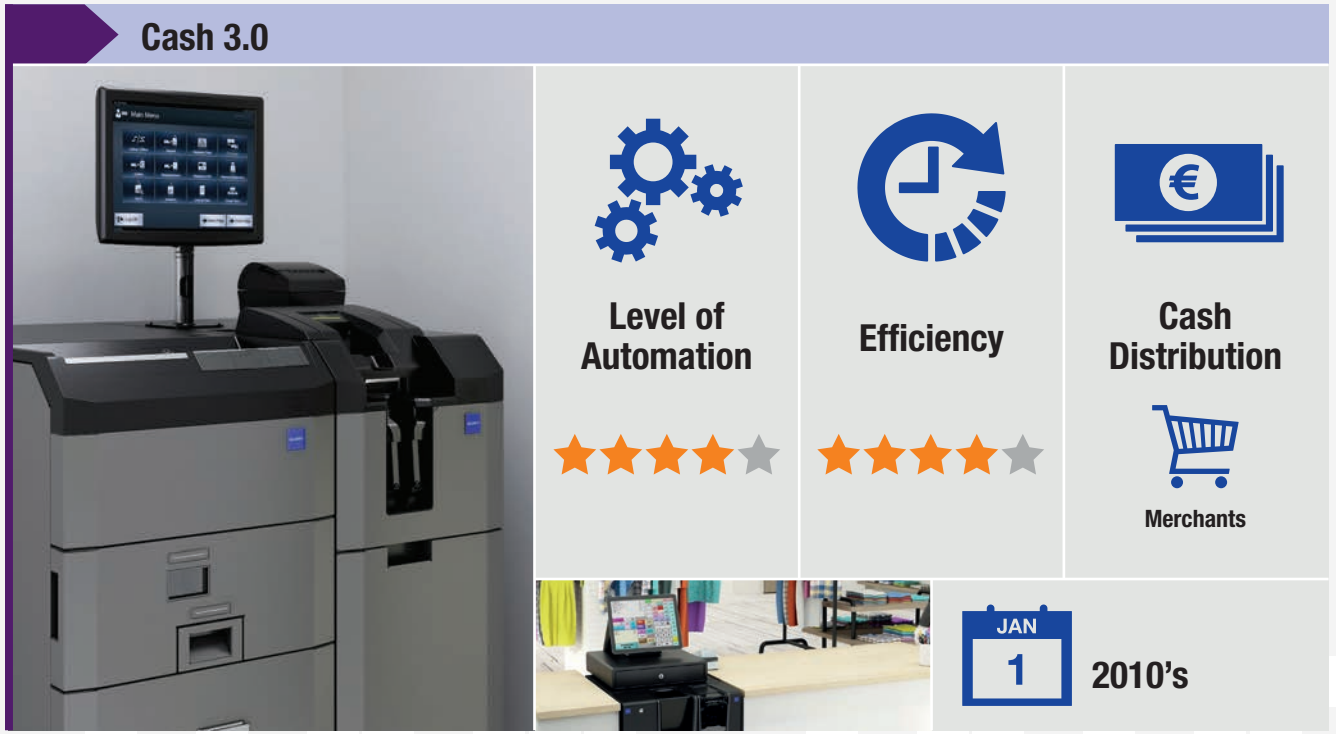
2000's

"RETAILERS USED TO GET THEIR CASH IN THEIR BANK ACCOUNT AFTER 3-5 DAYS, NOW AS SOON AS THEY GET THE CASH IN THE BACK OFFICE RECYCLER THEY CAN SEE THE MONEY IN THEIR BANK ACCOUNT THANKS TO GLORY CASHINFINITY™ SOLUTIONS ACCELERATING THE PROCESS."

CASH CYCLE 3.0
RETAIL AUTOMATION

A more efficient use of cash

A more significant change occurred around ten years ago when hardware suppliers that had previously focused on automating cash processes in bank branches and cash centres recognised the opportunity for improvement in on-site retail systems. More recently they have added recycling capability at retail outlets and have automated tasks such as preparing tills and reconciling bank deposits. The most important change has been the potential to re-use cash that was previously idle in safes. This includes the provision of cashback at the point of sale.



CASH CYCLE 3.0
RETAIL AUTOMATION [continued]

At the same time, banks and CITs have worked together to optimise the back-end processing of cash. Together they have stitched a very efficient network of cash centres that are largely operated by the CITs, with higher levels of productivity than the fragmented networks of the past. The newer more efficient cash centres reduced transportation and re-handling requirements and hence reduced the amount of idle cash in the overall cash cycle. This change was possible due to improvements in data sharing and improvements in the process such as smarter "one touch" deposit processing systems that allow a single vault teller to manage the count, document and sort processes from beginning to end. Previously this process required multiple staff members and very expensive sorting systems.

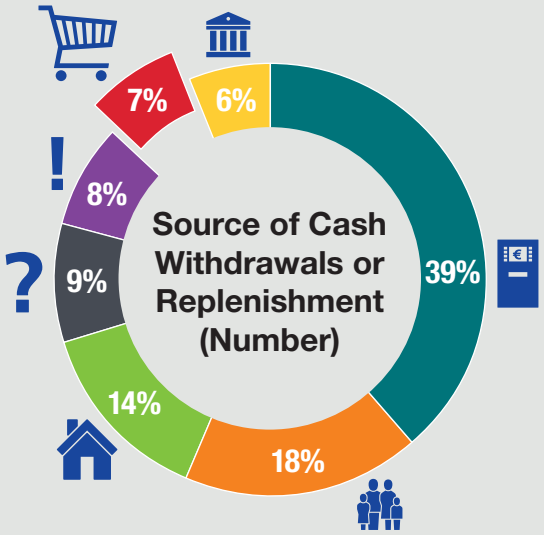
The result of these most recent innovations is a significantly more cash-efficient infrastructure. Take note, however, t**he Cash Cycle 3.0 is still a work in progress because these solutions are only in place in less than 10 percent of the total cash cycle around the world**. That said, like most new technologies it is spreading rapidly at a faster pace relative to any previous evolution in the cash cycle.

So, what comes next? We have already achieved significant and lasting improvements to the security and efficiency of the cash cycle and a redistribution of work between the same participants. With the adoption of Cash Cycle 3.0, cash efficiency is improving through the local redistribution of cash at retailers but the cash cycle remains, at its core, drastically inefficient and ripe for disruption.

DRIVERS
FOR CHANGE

There are still two basic issues to manage in order to fully optimise the cash cycle. Both occur in the interchange of value between sellers (retailers) and buyers (consumers).

- **Issue 1:** Too much money. Actually, too much incoming physical cash which effectively becomes dead money until such time that the merchant can get it moving.
- **Issue 2:** Wrong denominations. In the retail environment the cash supplied versus the cash distributed is unbalanced. There is a mismatch between the cash tendered as payment and the cash needed for change, which drives the need for CIT replenishment. Put simply, people find it easier to pay with large denominations and will normally require small denomination change as a result, therefore retailers will need to have change from banks and CITs.



	Average No. Per Person Per Year	Average Amount (EUR)
ATM	26.6	€73
Family, Friends & Colleagues	13.0	€25
Cash Reserves at Home (coin jar, etc)	9.5	€29
Cashback at Shop	**4.4**	**€15**
Bank Counter	3.8	€124
Other	–	€63
Not Stated	–	–

Source ECB and De Nederlandsche Bank

DRIVERS FOR CHANGE [continued]

These issues result in inefficiency of two types: **cost and convenience**. If we can address these mismatches (reducing demand for change, increasing cash distribution to consumers by retailers) then we could directly reduce the requirement for CITs and the involvement of commercial banks. This would also further reduce the amount of idle cash in the system and lessen the pressure on central banks to provide more cash in the economy overall.

Retailers have started to implement new ideas and solutions, such as cashback to customers to address this imbalance. With this idea, merchants are able to get rid of surplus cash, passing it directly to their customers who will come back again to spend it. It's a win all round, the retailer reduces their cash volume, and the customer benefits from the convenience of getting cash while they are visiting the store. And the idea can be taken even further, with a virtual ATM. The retail till can behave like an ATM, there are already supermarkets in Singapore and petrol stations in Germany deploying these kind of solutions. Applications like this demonstrate the power of local recycling to transform costs and reduce inefficiencies but mass adoption takes time. According to the European Central Bank only 7% of cash across the Eurozone is distributed to consumers in retail locations. The remainder is clearly still distributed via the traditional cash cycle, via ATMs and bank branches, being moved around between the key players and adding no value.

"ACCORDING TO THE EUROPEAN CENTRAL BANK ONLY 7% OF CASH ACROSS THE EUROZONE IS DISTRIBUTED VIA IN-STORE CASHBACK."

MATCHING
SUPPLY AND DEMAND

What can we learn from the experience of other markets?

Is there a cash cycle equivalent AirBnB, for example, who transformed the traditional hotel industry by matching supply and demand in the short-term accommodation market?

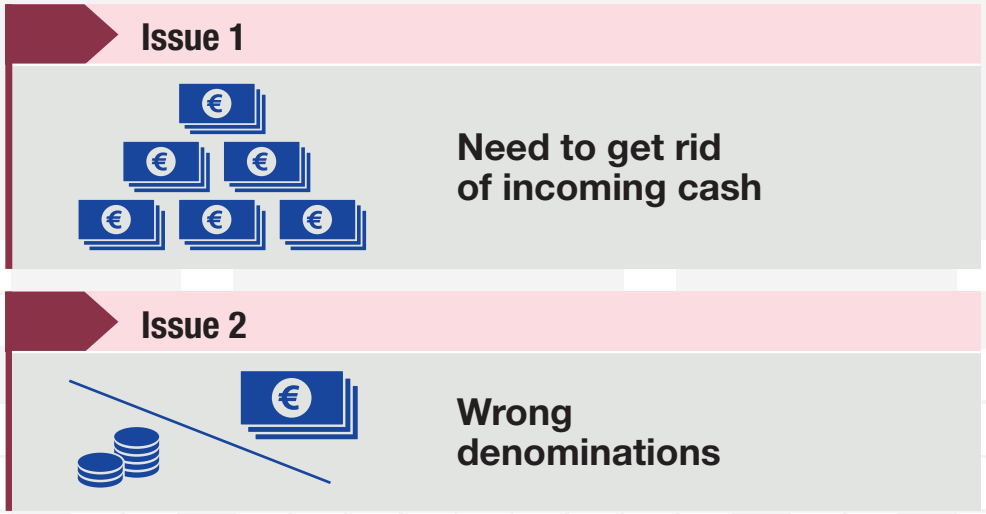
The first idea that might come to mind is electronic payments. Unfortunately, **electronic payments in themselves do not provide a solution**, because they do not have the immediacy and ubiquity of cash. They are also, at least today, less efficient than cash for the majority of retail transactions when you consider the systemic transactional costs.

Addressing issue 1 through encouraging "cash-back" to consumers at retail locations, is relatively simple, and will likely be directly driven by the economics of maintaining large networks for cash disbursement. How to optimise the ATM and branch networks? How to reduce their costs? Bank investment in marketing cash-back alliances with key cash sources (retailers) will be very efficient. For the retailer, the direct benefit is lower transactional banking costs. For both parties, the additional infrastructure investment is almost nil, particularly for those cases where the parties are already participating in Cash Cycle 3.0.

Solving issue 2 is more difficult. Can consumers be encouraged to use their lower-denomination change? Encouraging optimal consumer behaviour will undoubtedly be a challenge. Measures suggested have included consumer initiatives to return change to retailers:

- Pricing adjustments to lessen the likelihood of change
- Encouraging social responsibility - for example doubling or rounding up the change given to charity
- Creating incentives for consumers when they participate in a sharing approach to "change"

We should also consider the involvement of technologies like data mining, deep learning, blockchain and the Internet of Things (IoT) to optimise supply and demand in the right place at the right time.



SHARE ECONOMY
GOOD FOR THE CONSUMER

What would greater 'matching' achieve?

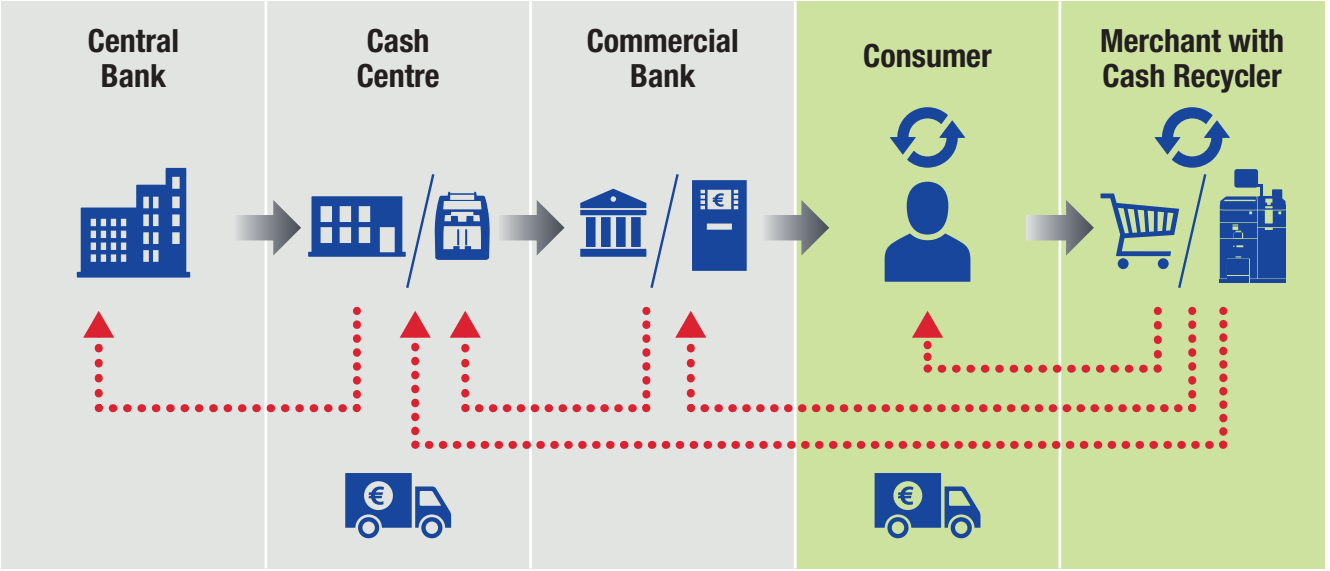
For retailers there would be lower CIT and bank charges. Meanwhile CITs would play an increasing role in balancing cash between retailers and banks. They would increase the profitability of the existing large cash handling infrastructure. While bank branches will optimise their infrastructure costs. And, as it has already been mentioned, **there would be less pressure on the central bank regarding cash supply**.

Disruption is inevitable in a vibrant market. The core challenge of cash and an efficient cash cycle is matching supply and demand as closely as possible to endpoint users and endpoint receivers.

There is a clear opportunity and new startups are stepping up with solutions to tackle these pain points. For example SoCash in Singapore is a simple mobile app that means anyone wanting to withdraw cash can immediately locate the nearest merchant who has surplus cash. Free to use, and unbelievably convenient. Their stated goal is to convert every shop and customer into a virtual cash distribution network, making cash circulation more efficient by deconstructing the expensive cash logistics supply and ATM networks globally. Last year in Spain, WohCash was launched under the same philosophy and similar business model.

SHARE ECONOMY
GOOD FOR THE CONSUMER [continued]

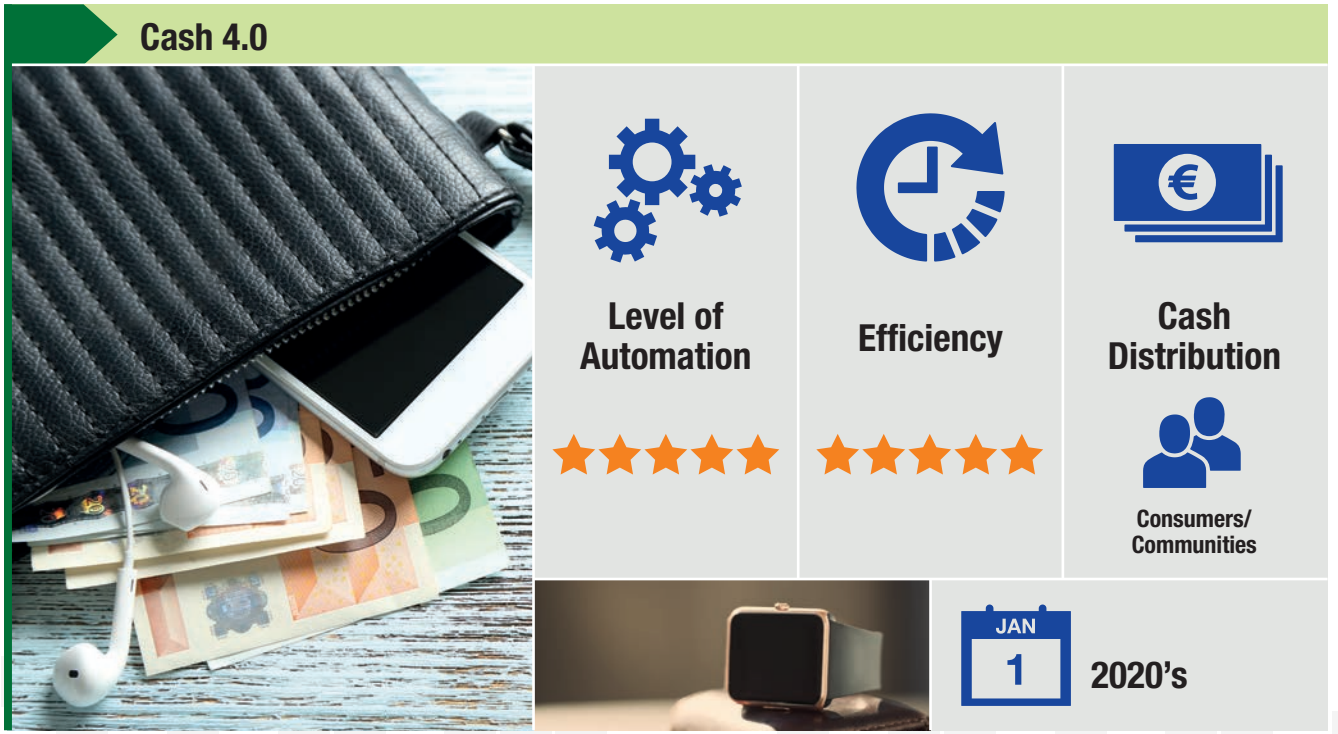
Another good example is Seven Bank in Japan. With recycling ATMs installed in 7-Eleven convenience stores across Japan, they offer the facility for small, local merchants to deposit cash, regardless of who they bank with. Consumers can then come along and withdraw that cash to spend locally. For example, a taxi driver could deposit his earnings in a Seven Bank ATM and then a tourist visiting Japan can withdraw cash to buy food in the 7-Eleven store and to use for a taxi back to their hotel. From business to consumer, and then right back to business again within one hour is extremely efficient.



CASH 4.0
THE COMMUNITY CASH CYCLE

GLORY's vision is that Cash 4.0 will be the Community Cash Cycle.
Consumers and merchants will work together for common benefit, addressing the issues and challenges that have been identified in the current Cash Cycle 3.0.

This possible future – the community cash cycle – begins to feel a bit more like it was 10,000 years ago when people bartered fish for wine. Now, we have merchants with surplus cash providing it directly to consumers who have a shortage of cash, and consumers who have coins hoping to find a merchant who needs change for their tills.



CASH 4.0
THE COMMUNITY CASH CYCLE [continued]

And so the traditional cash cycle is poised for a big change.

Will Cash 4.0 be disruptive? Maybe. It is important to understand that disruption simply only occurs when the current system is not adapting to change fast enough. So who will drive Cash 4.0? Who will bring the next disruption? The banks? The CITs?

Or will it be a new comer? Like SoCash in Singapore or another fintech start-up?

It could be an existing player such as 7-Eleven/Seven Bank or perhaps another global retailer.

The challenge for Glory and our partners is to drive the evolution of the cash cycle to ensure its stability while at the same time radically reshaping it to improve cost and experience.

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