

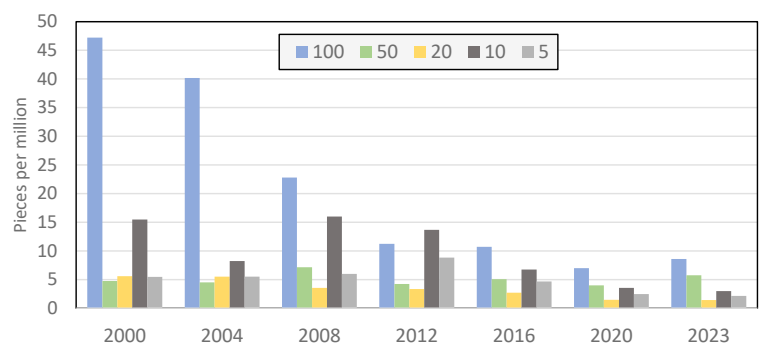
CURRENCY NEWS™

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Fall in US Counterfeits, Says New Report



Suspected counterfeit note detection rates by denomination – 2000-2023 (source: Federal Reserve Board).

Financial authorities remain concerned about counterfeiting US currency; however, recent studies suggest a declining trend in the circulation of fake banknotes. A new report by Ruth Judson and published by the Federal Reserve – **Estimating the Volume of Counterfeit US Currency in Circulation** – provides insights into counterfeit US dollar circulation and its economic impact.

The scope of counterfeiting

The US dollar is one of the most widely used currencies worldwide, with circa. \$2.3 trillion in circulation at the end of 2023. However, not all this currency remains within the US; estimates suggest that half to two-thirds of all US banknotes are held outside the country.

In 2023, the US Secret Service recorded \$102 million in counterfeit currency passed, but the report estimates that only about \$15 million in counterfeit notes were actively circulating at any given time. This equates to roughly one fake note for every 80,000 genuine notes – a significant improvement from previous estimates.

Declining rates

The study reveals a substantial decrease in counterfeit rates over

the past two decades. In 2005, estimates indicated one counterfeit note for every 10,000 genuine notes in circulation; this now stands at one per 40,000 – or even one per 80,000. According to the report, this decline can be attributed to:

- Enhanced banknote security features such as watermarks, threads, and colour-shifting ink
- Improved public awareness regarding counterfeit detection
- Increased efforts by law enforcement, particularly the Secret Service.

Estimating the total counterfeit volume

To estimate the volume of counterfeit currency in circulation, the report analyses two primary sources –



... Fall in US Counterfeits

cash processing data from the Federal Reserve and reports from the Secret Service, which investigates and identifies counterfeits and their sources.

The study concludes that the total counterfeit volume in circulation is around \$15 million, with an upper limit of \$30 million. Counterfeit \$100 bills are estimated to account for most of this, ranging between \$2.8 million and \$8.5 million.

Counterfeit \$20 bills are estimated to be between \$1 million and \$3 million.

Low denominations (\$1, \$5, \$10) and the \$50 account for very few counterfeits.

Most counterfeiters do not produce high-quality fakes but depend on low-quality copies that can deceive unsuspecting individuals during swift transactions. The report indicates that most counterfeit notes in circulation are of poor quality, which can often be identified easily with minimal scrutiny.

The economic impact of counterfeiting

Although \$102 million in counterfeit money was recorded in 2023, the actual financial losses from counterfeiting remain small compared to other forms of fraud:

The report estimates that counterfeit-related losses amount to approximately 30 cents per US resident each year. By contrast, credit card fraud costs the US economy over \$12 billion annually – ie. more than 100 times the estimated losses from counterfeit currency.

How long do counterfeit notes stay in circulation?

The study also examined how long counterfeit money remains in circulation before being detected:

It concluded that most fake bills are identified within one month of entering circulation, whilst even in the worst-case scenario, counterfeits typically do not last more than three months before being identified.

This suggests that counterfeit bills have a short usability window before being removed from circulation.

Conclusion

The report concludes that counterfeiting of US currency is at historically low levels and that, while fake money remains a threat, the total volume in circulation is far less than previous estimates. With continued innovation in security features and public awareness, the risk of counterfeit money impacting the economy will remain minimal.

Euro Counterfeits on the Rise Again

554,000 counterfeit euro banknotes were withdrawn from circulation in 2024, according to the European Central Bank. This is an increase of more than 18% compared with 2023, and resulted in a ratio of 18 ppm, compared with 16 ppm the previous year.

The last time the half million mark was breached was in 2019, ie. before the pandemic, during which period counterfeiting and economic activity dropped sharply. The former has climbed ever since, but even so – the ratio is far below previous levels, with the ppm figure surpassing 30 as recently as 2017, and averaging nearly 50 in the middle of the last decade.

As in previous years, the €20 and €50 accounted for the majority of counterfeits – 36% and 43.6% respectively. The combined total of 79% was higher than 2023's 70%.

Some, but not all, National Central Banks (NCBs) have also published the counterfeiting rates specific to their countries, which vary considerably. Between them, the 11 out of the 20 eurozone NCBs that have reported account for just over 262,000 counterfeits, or 47% of the total.

In Cyprus, 571 counterfeits were withdrawn from circulation in 2024, marking an 11% decrease compared to 2023 (compared with a 42.4% increase in 2023 versus 2022).

11,039 counterfeit banknotes were withdrawn in Portugal, down 34% from 16,723 in 2023 (versus an increase of 55% the previous year).

The Croatian National Bank recorded 4,516 counterfeits, a decline of 8.2%.

714 counterfeit euro banknotes were detected in Finland, an increase of 9.3%.

In Slovakia the figure was an increase of 9.4% to 1,857.

The Bank of Italy identified 121,111 counterfeits, compared with 104,669 in 2023, an increase of 15.7%.

In Belgium, the number increased by almost 30% to 14,341.

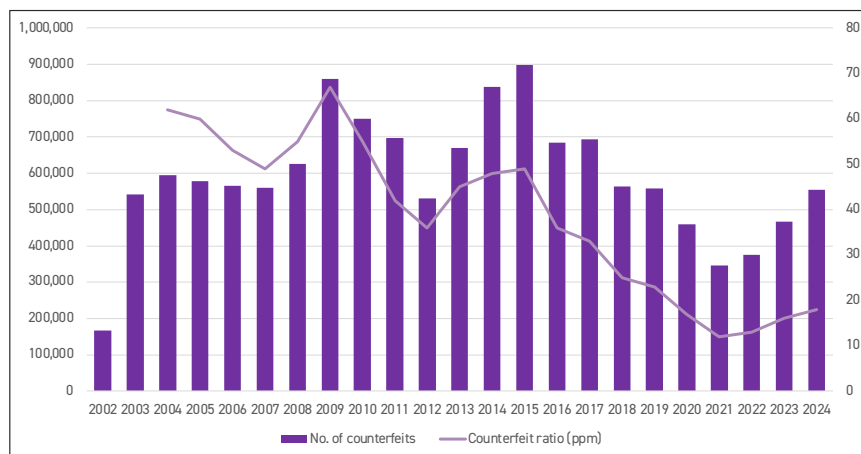
As it did in Austria, where 10,213 counterfeit banknotes were seized.

Germany witnessed a similar increase – by 28% to 72,400 (the same as in 2023). However, financial losses caused by counterfeit currency decreased by 12% as forgers, who had previously focused on €200 and €500 notes, shifted to producing lower-denomination notes with simpler counterfeiting techniques, said the Bundesbank.

The Federal Criminal Police Office (BKA) stated that China and Türkiye are leading sources of counterfeit euro notes. It also highlighted that counterfeit money is primarily used by teenagers and young adults, who exploit it to purchase inexpensive items to receive as much legitimate change as possible.

The Netherlands saw an even sharper rise, with 24,100 counterfeits taken out of circulation – a 40% increase (compared with a decrease of 54.5% the previous year). De Nederlandsche Bank has reported that the increase was mainly due to several fraud cases involving large quantities of low-quality counterfeit €200 notes.

The biggest increase of all was in Estonia, where the number more than quadrupled, from 264 to 1,195 (versus a fall of 43% in 2023). According to Eesti Pank, the number was distorted by the seizure of one third of all counterfeits discovered from just one citizen.



Euro counterfeits 2022-2024 by number and ratio.

News in Brief

■ Trump Calls for End to Penny Production

President Trump’s announcement of a directive to the US Treasury Secretary to cease production of the country’s lowest denomination coin, as part of his mission to cut government expenditure, has reignited the debate in the US about the future of the penny, which has been rumbling on for well over a decade now.



According to the US Mint’s Annual Report for 2024, it currently costs 3.69 cents to produce each circulating penny. These costs have jumped from 2.7 times the face value of the coin in 2022, creeping steadily closer to costing four times as much as the penny is worth. Negative seigniorage currently sits at \$85.4 million.

The US Mint produced 3.2 billion cents in 2024, roughly 10 coins per capita. There are approximately a quarter of a trillion 1 cent coins in circulation in the United States, suggesting no shortage of pennies available. But getting them to circulate effectively is a challenge that the US Coin Task Force is still grappling with.

President Trump’s directive only referred to stopping the production of new pennies; any withdrawal will likely involve the US legislature. Various bills introduced over the years to drop the penny or alter its composition to make it cheaper to produce (along with the nickel) have all failed to advance to enactment.

As the current administration looks to save a significant chunk of change wherever it can, it remains to be seen whether the humble penny will finally be scrapped.

■ Applied DNA Exits Authentication

Applied DNA Sciences (ADNAS) is to discontinue its DNA tagging and security services business. This decision is part of a broader restructuring effort that includes a 20% reduction in workforce, mainly in the DNA tagging segment.

ADNAS has explored various industries over the years for its authentication offerings, including SigNature® DNA, which are all based on forensic grade synthetic DNA markers.

Long ago, it partnered with Thomas Greg & Sons, a South American security printer, to participate in a currency and security printing pilot programme.

It was also selected by Loomis to protect its cash box technology in the UK, where the taggant was incorporated into the indelible ink to positively trace cash and valuables stained during robberies back to their source, and which proved instrumental in helping to convict a number of criminals.

Brinks in the US was another customer, utilising the technology in its security bags for cash.

Despite these collaborations and many others in the pharma and textile sectors, adopting the ADNAS platform remained inconsistent, particularly in industries where alternative authentication technologies were more accessible. One of the platform’s main challenges was its reliance on dedicated readers, which made it less convenient than other tagging solutions that work with standard smartphone cameras and sensors.

■ Cash Associations Join Forces

The European Intelligent Cash Protection Association (EURICPA), the ATM Industry Association (ATMIA) and the European Security Transport Association (ESTA) have announced new three way strategic partnerships aimed at strengthening ATM security, tackling physical attacks on cash machines and cash transportation security.

EURICPA represents leading European manufacturers of intelligent security solutions for cash protection, working closely with stakeholders to enhance the security and resilience of the cash cycle.

ATMIA is the leading non-profit trade association representing the global ATM industry. It serves more than 9,000 members from over 650 participating companies in 65 countries spanning the whole ATM ecosphere, including financial institutions, independent ATM deployers, equipment manufacturers, processors, and service providers. It recently merged with the ATM Security Association (ASA).

ESTA is a non-profit association, established in Brussels in 1975, which represents the interests of the CIT sector throughout Europe and count 90% of the European cash management companies as members.

The EURICPA-ATMIA partnership aims to unite the expertise, resources, and networks of both associations to address growing ATM security challenges, whilst the cooperation agreement with ESTA will involve pooling expertise and resources to champion the continued relevance and value of cash in modern society.

Meanwhile the partnership between ATMIA and ESTA aims to enhance the efficiency

and security of financial transactions and access to cash globally. Both have common interests in the preservation of cash in society and will seek to share information and align views on policy developments of common interest in order to communicate jointly with regulators and policymakers.

■ New Currency Symbol for the Riyal

The Saudi Central Bank (SAMA) has launched a new currency symbol for the riyal, intended to promote the Arab kingdom’s financial and cultural identity on the international stage and reinforce the role of the national currency.

The symbol represents the word riyal in a design derived from Arab calligraphy, signifying both the modernity and tradition of Saudi Arabia.

Work on the riyal symbol initiative began following a royal directive to form a committee composed of relevant entities including SAMA, the Ministry of Culture, the Ministry of Media, and the Saudi Standards, Metrology and Quality Organization.

The project went through multiple phases to ensure the symbol was designed according to the highest technical standards, said SAMA, which has issued guidelines for its use. The final phase was its launch by the Custodian of the Two Holy Mosque, namely King Salman bin Abdulaziz Al Saud.



Currency News Goes Bi-Weekly

Those of you who are signed up to our weekly news service will have noticed that it is now bi-weekly. We have also amended the layout so that it is quicker and easier to read.

In addition, we have combined it with Cash & Payment News™ and Coin & Mint News™ so that the latest news across the whole spectrum of cash will be brought to you with more frequency.

As a subscriber to Currency News™, you should be automatically enrolled into the (now bi-weekly) news service. If not, then visit currency-news.com to sign up or contact us.

Positive Picture for Cash Companies Continues in 2024

Each February and March we cover the previous year's results for the leading companies in cash management, most of whose financial years run from January to December. Between them these results provide a useful means of taking the pulse of our industry.

The post-COVID rebound appears to be continuing, if the results we cover this month from Crane NXT, Loomis, Diebold Nixdorf and Brinks are anything to go by. Next month will be the turn of NCR Atleos, Orell Füssli, Prosegur and Spectra Systems.

Crane NXT – a year of expansion

Crane NXT was set up in April 2023, when Crane Holdings was separated into two independent publicly traded companies, and now comprises Crane Payment Innovations (CPI) and Security & Authentication Technologies (SAT). The latter includes Crane Currency (printer, papermaker and security features), brand protection specialist OpSec (which was acquired in early 2024) and the smart packaging assets of TruTag Technologies (acquired late 2024). If the agreement to buy the authentication division of De La Rue is successfully concluded (expected in the second quarter of 2025), it will join SAT as well.

Revenue for 2024 was \$1.48 billion, a near 7% increase over 2023. Core sales growth was up 1.1% to \$15.7 million, driven mainly by the banknote business, with acquisitions accounting for \$86 million (up 6.2%), and foreign exchange a loss of \$6.2 million.

CPI contributed \$873.2 million in revenue (58.7% of the total), down by 1.5% compared with 2023. SAT contributed \$613.6 million (41.3%), up by 21.5% compared with 2023.

Operating profit fell by 6.3% to \$268.8 million, resulting in a margin of 18.1%. This was mainly due to a fall of 6% in CPI's operating profit to \$228.4 million, driven by an unfavourable mix, lower volumes and restructuring charges.

SAT's operating profit fell by 4.6% to \$110.9 million, driven by the dilutive impact of the OpSec acquisition and higher material and other manufacturing costs, partially offset by favourable pricing in the currency business.

The results were also affected by the separation of Crane Holdings into the two companies, with transaction-related expenses and restructuring charges of \$30 million.

For 2025, Crane NXT is forecasting sales growth of between 1% and 3% (between

0% and 2% for CPI, and between 3% and 5% for SAT).

Record year for Loomis – again

Loomis reported turnover of SEK 30 billion for 2024, up by 6% over 2023, breaking its own record of the previous year.

The company performed particularly well in the USA (with record sales of nearly SEK 16 billion and a margin of 15.7%), while margins improved in Europe and Latin America. Loomis Pay had a particularly solid performance in the 4th quarter, helped by the acquisition of Hosteltactil, a Spanish developer of POS solutions, earlier in the year.

Operating income (EBITA) for the year increased by 18.36% to SEK 3.64 billion and the operating margin went from 10.7% to 12%. Net income was up 1% to SEK 1.64 billion.

In terms of business activities, sales were split between CIT (SEK 10.7 billion), Cash Management Services (SEK 5.3 billion), ATM services (SEK 6.3 billion), Automated Solutions, which includes SafePoint smart safes and the cash automation specialist Cima acquired in 2023 (SEK 5.5 billion), International, which handles cross-border transportation (SEK 1.6 billion), FXGS foreign exchange services (SEK 628 million), and the payment processing service Loomis Pay (SEK 106 million).

The company's targets for 2005-2007 are CAGR of 5-7 % per year for revenue, and an operating margin (EBITA) of 12-14%. It also noted that CO2e emissions (scope 1 and 2) should reduce by 34% by 2027 compared with 2019.

Diebold Nixdorf continues recovery

Diebold Nixdorf emerged from Chapter 11 bankruptcy and began trading again on the New York Stock Exchange in August 2023. It has reported positive unaudited full-year financial results for 2024, albeit there are no comparable full year performance figures for 2023 to compare due to the company reporting that year in two periods (January to August and then August to December 2023).

GAAP total revenue was \$3.75 billion, operating expenses were \$737.9 million, operating profit was \$182.1 million, and the operating margin was 4.9%. By comparison, non-GAAP results also

indicated total sales of \$3.75 billion, but operating expenses of \$643 million, operating profit of \$305.3 million, and an operating margin of 8.1%.

GAAP net income was a loss of \$14.5 million, whereas non-GAAP net income was \$87.5 million. The non-GAAP adjusted EBITDA was \$452.2 million, a margin of 12.1%.

Revenue from the Banking segment was \$2.76 billion (73.65% of total revenue), of which Services accounted for \$1.58 billion (57.5%) and Products \$1.17 billion (42.5%). The Retail segment produced \$988.3 million in revenues, of which Services accounted for \$563 million (57%) and Products \$425 million (43%).

According to the company, the strong performance in 2024 has enabled it to pay down \$338 million of debt and initiate a \$100 million share repurchase program to return value to its stockholders.

The outlook for 2025 is for revenue to remain flat to low single digits and adjusted EBITDA between \$470 and \$490 million.

Highly profitable year for Brinks

Brinks' GAAP financial results indicated revenue grew by 3% in FY 2024 to just over \$5 billion, operating profit by 7% to \$453 million, and net profit (adjusted EBITDA) by 86% to \$163 million.

Non-GAAP revenue was also just over \$5 billion, but operating profit was significantly higher at \$629 million, a 2% increase over 2023, as was net income at \$912 million, a 5% increase over 2023. At constant currency (non-GAAP results at 2023 exchange rates) revenue increased by 13%, operating profit by 27% and net income by 23%.

(Not included in the non-GAAP results are charges of \$47.5 million relating to an agreement reached between Brinks Global Services USA, the US Department of Justice, and the US Treasury's Financial Crimes Enforcement Networks (FinCEN) to resolve investigations related to historical cross-border currency shipments and compliance with federal money-transmitting laws).

According to President and CEO Mark Eubanks, '2024 completes another year of strategic progress as we continue to transform Brink's into a faster growing, more profitable and higher cash flow generating business. Over the year, we accelerated organic growth, expanded our EBITDA margins and generated \$400 million of free cash flow. We remain steadfast in our strategy to improve our revenue mix, drive waste out of our operations through the Brink's Business System, consistently improve cash conversion and return excess capital to our shareholders.'

Central Banks and Cash Round-Up

Continuing with the periodic series of articles covering cash information in central bank annual reports, this month we travel to Korea, and also to South America, with a review of two countries, one small and stable (Uruguay) and the other larger and not so stable (Venezuela).

■ Bank of Korea (BOK)

Cash in circulation: the BOK issued new currency worth 26.3 trillion won (KRW) in 2023 while withdrawing KRW 20.1 trillion from circulation, resulting in KRW 180.9 trillion of currency in circulation at year-end – a modest 3.6% increase from 2022.

By denomination, the amount of 50,000 and 1,000 won banknotes in circulation increased compared to the end of the previous year, while that of 10,000 won and 5,000 won banknotes and coins showed a downward trend.

KOMSCO produced and supplied BoK with 530 million banknotes and 101.05 million coins, versus 710 million and 82.7 million in 2023 (down 25.4% and up 22.2% respectively). The slowdown in demand for banknotes was attributed to the opportunity cost of holding banknotes increasing in line with rising interest rates. The total value of the produced currency amounted to KRW 12.7 trillion, a decrease of 36.5%.

The BOK destroyed 483.85 million notes and coins deemed unfit for circulation, valued at KRW 3.8803 trillion. This marked a 17.2% increase from the previous year. Of the destroyed currency, 427.32 million were banknotes valued at KRW 3.8724 trillion, and 56.53 million were coins valued at KRW 7.9 billion.

In August 2023, the BOK launched an automated vault system to enhance efficiency in inspection, order management, inventory and logistics.

Counterfeiting: 184 counterfeit banknotes were discovered, an increase of 32 from the 152 counterfeits detected in 2022. This marked the first rise since 2017. The majority – c. 60% – were the 5,000 won.

Right to use cash: the BOK reaffirmed its commitment to protecting the right to use cash, having actively promoted this right since 2020 through public campaigns in major cities, train stations, convenience stores, and on digital platforms. The Bank plans to continue such campaigns to mitigate the adverse effects of the transition to a cashless society.

As part of this, in December 2023, the BOK introduced a 'QR code-based Mobile Cash Card, which enables customers to deposit

or withdraw cash at ATMs operated by the 17 banks using the Mobile Cash Card app or bank-specific mobile banking apps. The BOK plans to expand this service to ATMs operated by non-bank institutions to further enhance access to cash.

■ Banco Central del Uruguay (BCU)

The BCU published its 2023 annual report in mid-2024, halfway through Bank-wide strategic initiatives that began in 2021 and are expected to be completed by 2025.

These cover developing an effective monetary policy to achieve ambitious inflation targets, modernising the nation's financial system and improving the management of operations, including digital transformation.

Cash in circulation: due to well-controlled inflation, fixed time deposits in the UYU (Uruguayan peso) increased 9.3% in real terms in comparison to 2022, and deposits in US dollar decreased 1.2%, an unusual circumstance as the dollar has traditionally seen an increase as a reserve of value option.

Cash in circulation in 2023 maintained expected levels, with the total at the end of the year amounting to UYU 106.2 billion, made up of 102.9 billion banknotes and 3.3 billion coins. The value of the total currency in circulation was approximately \$26.6 billion.

Circulating banknotes are available in denominations of 20, 50, 100, 200, 500, 1,000 and 2,000 Uruguayan pesos, and their respective share of the total banknotes in circulation is 22%, 15%, 15%, 7%, 7%, 21% and 13%.

Coins are denominated in 1, 2, 5, 10 and 50 Uruguayan pesos, with their respective share of total coins in circulation at 47%, 29%, 13%, 10% and 1%.

One could posit that these numbers show that the larger coin denominations circulate less than the 20 and 50 banknotes.

Unfortunately, the bank's annual report does not enter into details on distribution or destruction of unfit currency, stating only that distribution was at 'normal' levels and that destruction was 'in line with the bank's capacity for that item'.

■ Banco Central de Venezuela (BCV)

Although this may not come as much of a surprise, given that hyperinflation has averaged 3,605.8% since 1973, the last annual report published and available on Venezuela's central bank website was in 2016.

For the purposes of understanding the Bolívar's (Bs) history, a quick timeline might be useful:

- **1879-2007:** Bs (Bolívar) in circulation.
- **2007-2018:** Bs.F (Bolívar Fuerte) issued and in circulation.
- **2018-2021:** Bs.S (Bolívar Soberano) in circulation. However, 5 zeroes were eliminated in 2019 and it became once again known as just Bs (Bolívar).
- **2021-2024:** In October of 2021, a new denomination, Bolívar Digital, also abbreviated as Bs, allowed existing Bs.S banknotes to be valued as Bolívar Digital by simply dividing by 1 million. For instance, the highest Bs.S banknote, Bs.S 200,000, became then equivalent to Bs. 0.20.
- **2024-2025:** Finally, all Bs.S banknotes became null and void as of 25 September 2024 and current banknotes in circulation are the Bs. 5, 10, 20, 50 and 100. The largest banknote denomination, the Bs.100, was valued at about US\$9.98 in mid-February, 2025.

In mid-2024, the BCV published an edict stating that citizens had until 24 September 2024 to collect and deposit all of their Bolívar Soberano banknotes in order to receive the equivalent amount in the replacement Bolívar Digital. There is no information as to how many were actually returned to the bank for destruction.

In 2019, Venezuela saw record high inflation in February, at 344,509.5% and although this had declined to 75.9% in early 2023, the impact of hyperinflation and constant currency devaluation has resulted in a number of negative effects for the currency. Not least amongst these is the fact that cash usage in Bolivares today is not precisely widespread or valued by the Venezuelan people. As a result, cash in Venezuela, unless it is in US dollars, is not likely to make a quick comeback.

A positive aspect of the BCV website is that balance sheets are updated every semester. Information for Q3 and Q4 of 2023 shows that at December 2023 total currency in circulation was made up of 5.8 billion banknotes and 9.8 million coins. With respect to currency taken out of circulation in 2023, the numbers are quite small - 221,114 banknotes and 6,118 coins.

A Foot in Both Camps – How G+D is Navigating the Digital Transformation in Money

The landscape of currency is undergoing a significant transformation. While cash remains a fundamental means of payment, the rise of digital transactions and Central Bank Digital Currencies (CBDCs) is reshaping the future of money.

One company at the forefront of this evolution is Giesecke+Devrient (G+D), a global leader in security technology and currency management. Dr Wolfram Seidemann, CEO of the group's Currency Technology business unit, shared with Currency News™ his insights into the company's journey in currency technology, the future of cash, the role of CBDCs in a rapidly digitising world and how G+D is addressing the markets for two different forms of public payments that, in the minds of some, are competitive.



Q: To start, can you give some personal background on your career to date?

A: I have a degree in Electrical Engineering from the Technical University of Munich and joined G+D in 1999, starting in the smart card division within R&D. From there, my career took me across Asia, including Singapore and Taiwan, where I was responsible for the region. I moved back to Europe and was responsible for the sales of banknote processing systems. After that I took over as the head of Louisenthal, focusing on security features and paper, before taking on the position of CEO of Currency Technology in 2017.

Q: Most of the sector is already familiar with G+D, but could you briefly summarise the activities of Currency Technology?

A: G+D is a SecurityTech company with three business segments – Digital Security, which covers mobile connectivity and IOT, identity and digital infrastructure; Financial Platforms, providing payment technologies and trusted software for private financial players; and then Currency Technology.

Here we are focused on a holistic offering for public currencies. Our division for banknote solutions involves the substrate, design and production of banknotes. Second is currency management solutions, which relates to the cash cycle and

includes intelligent automation, banknote processing and services. And third is our own unit for Central Bank Digital Currencies (CBDC), created in 2018.

Q: The commercial paper and print sector have consolidated, and reduced, over the past few years. Cash use is falling (in some parts of the world). Did you see this coming, and is this why you have branched out into CBDC?

A: Despite popular narratives suggesting the decline of cash, we actually see cash in circulation increasing on a global scale. In some cases growth has even been in double digits.

However, in the usage of cash, there are different regional developments. We did an interesting analysis recently where we looked at the percentage of cash use in the country, and the change of cash use over time. From this, we identified three scenarios.

There are countries with high volume of cash usage, where central banks have even told us they are struggling to manage the volumes. There are countries in which cash transactions at the point-of-sale are decreasing, at the same time the circulating volumes remain high. That's the classic cash paradox, where cash serves as store of value. And we see countries with declining usage of cash as people switch to alternative payments.

Despite these different development paths, cash keeps its vital role as reliable and most inclusive payment method in today's world with an evolving payment landscape. During times of uncertainty, demand for cash often spikes, reinforcing its role as a financial stabiliser.

That's why G+D continues to invest in its strong currency technology business and fosters innovation to ensure that cash remains relevant and secure.

At the same time, cash as the only form of public money does not function in the digital sphere. We anticipated this global payment trend early and extended our activities into the offering of a digital form of public money. Therefore we have our foot in both fields, co-existing side by side and complementing each other.

Q: Can you describe your journey to CBDC and where you are today?

A: We actually started exploring CBDCs in 2017 in an internal Think Tank. We assembled a team of experts – including cryptologists, digital payment specialists, and even historians – to analyse the evolution of money. At first, we questioned whether a new form of money was even necessary. Digital payments by private entities already existed. But we wanted to understand if a state-backed digital currency could offer advantages or any use case that couldn't be solved by existing digital payment solutions.

The turning point for CBDCs came with Marc Zuckerberg's project Libra in 2019 with the intention to create a dedicated currency for the Facebook community, and with China's digital yuan. Libra in particular was a wake-up call. It showed that private entities were moving quickly into digital currency, which raised concerns about sovereignty and monetary control. Central banks needed to act.

And so did we.

Unlike cryptocurrencies or private digital payment platforms, CBDCs are issued and regulated by central banks, ensuring trust and stability. In consultation with central banks and looking at the available technologies out there, we developed our own technology stack Filia, today a production-ready CBDC solution designed to meet the demands of central banks worldwide.

The solution is token-based and provides cash-like features like a high level of privacy, universal usage, accessibility and trust. The protection of data is of utmost importance to a CBDC, unlike commercial digital payment solutions that collect user data as part of their business model.

And another still is financial inclusion. CBDCs can provide unbanked populations with access to digital financial services without requiring traditional bank accounts.

One major USP of our solution is its ability to conclude offline transactions. Issues with digital transactions can be driven by technical disruptions, power outages, cyber-attacks, or even natural disasters such as storms or floods. G+D's Filia solution enables peer-to-peer transactions also in situations without an internet connection.

Q: Where have you been successful to date?

A: We've now worked with several central banks to pilot CBDC solutions. For example, we have collaborated with Ghana on both online and offline CBDC implementations. Other partners include the central banks of Thailand, Hong Kong, Brazil, and Eswatini.

And we have won several awards, for example as winner of Global CBDC Challenge Monetary Authority of Singapore

and of Best Technology Hong Kong Monetary Authority.

Recently we were cited by Juniper Research as the leader in CBDC solutions, which I think is a great reflection of our journey and what has gone into the development of our solution.

Q: In your digital payment journey, are you just focusing on CBDC, or other forms of digital payments as well?

A: Yes. In its portfolio the G+D Group stands for the freedom of choice in payments. As mentioned earlier we address card and digital payment solutions for commercial banks and e-commerce solutions for merchants in our business segment Financial Platforms. But within Currency Technology, our focus is on CBDC and, in particular retail CBDC.

We believe that central banks need to provide a basic public infrastructure for payment. They do that already with cash, and they also do that in the digital space with account-to-account payment solutions, offering wholesale settlement systems to commercial market participants. But there aren't any digital, state-backed payment instruments for citizens. Currently only arrangements with private third parties are available to them.

We all know the value that the public option brings to us because cash is available to everybody, independently from social status or certain prerequisites. Cash payments don't collect data. Cash protects your privacy. And cash is fully inclusive. Our goal, and focus on retail CBDC, is to transfer these values into the digital space.

The company's expertise in both banknotes and digital security solutions makes it a trusted advisor for central banks navigating this transition. We don't just provide technology; we help central banks design their entire digital currency ecosystems.

Q: Which brings us neatly to the co-existence, or lack of it, between physical and digital cash. One common concern is that CBDCs will replace cash. How do you answer this concern?

A: They will co-exist. Cash has unique advantages – a banknote is a banknote is a banknote, and the beauty of it is that it works independently and does not require any interoperability. It is also universally applicable and is fully private.

However, CBDCs can complement cash by offering a standardised, interoperable digital public payment option if one is needed. There are many ways that this interoperability could work. For example, ATMs that allow users to exchange cash for CBDCs and vice versa, or digital wallets that accept both cash and CBDCs, or payments that provide change in digital form.

Contrary to the existing fragmented market for digital payments, a CBDC will be completely interchangeable. That's what makes it so attractive because it can provide the strongest network effect, and in some countries, there is even a debate to make it legal tender. Which will further accelerate acceptance that will, in turn, drive standardisation.

All of this will happen in parallel to the physical version of a currency because people will always want, and need, to hold the value of their money in their hands, and that is cash.

Q: You mentioned earlier that a retail CBDC will enhance financial inclusion. How?

A: CBDCs have the potential to enhance financial inclusion significantly. While cash is the most inclusive payment method, existing digital payment solutions require a bank account, or connection devices, which come with a certain cost, and so are a barrier to including all groups of society.

CBDCs, by contrast, can bring digital payments to everyone, also to unbanked populations. For example, in a pilot with Ghana, unbanked individuals could use CBDCs, allowing them to participate in e-commerce and digital services. Over time, digital wallets can serve as an entry ramp to the broader financial system, enabling access to credit and other services.

Q: Moving now to cash, which is still important to G+D. Less cash and sustainability all point towards streamlining the cash cycle, and less profit from cash is changing the traditional business model associated with cash cycle operations. What opportunities and threats will this bring for G+D in particular, and the industry more broadly?

A: As mentioned before, we recently identified three different scenarios in the usage of cash.

First are countries with high volumes of cash usage, where the challenge is managing these volumes, and solutions include clean note policies, along with efficient cash cycle management.

Second are countries in a classic cash paradox. Here, efficiency is important, to make cash attractive and not an expensive solution for businesses, and to ensure that an infrastructure is still in place to meet requirements for access, availability and acceptance of cash.

And then there are those countries where cash is declining and where governments are having to step in to ensure continued access to cash.

Each of these countries or scenarios require different solutions. And yes – there are opportunities for all three, but also threats because if we fall below a certain threshold of cash at the point of sale, it

becomes more difficult to come up with intelligent solutions to keep cash attractive and in circulation.

So, for example, take a country like the Netherlands where cashback doesn't work because there's not enough cash being used to enable it to be paid out from the tills. So obviously that particular tool was introduced too late in the cash cycle.

And we have to think too about solutions that allows people to access cash and to allow businesses to accept it at a competitive cost level. Strategically, we look into these changing developments of cash usage, adapt our offering accordingly to the regional needs of central banks and drive innovative solutions.

Q: Let's talk about the technological solutions impacting cash, and G+D.

A: Let me have a look at Artificial Intelligence (AI) as we draw our attention on its implications and opportunities in the cash cycle. G+D is actively leveraging AI innovations, which can be used for counterfeit detection, cash cycle optimisation, and even generating certain banknote designs.

We have been using machine learning for some time already, so that our sensors on our processing systems learn from the data and adapt their capabilities to identify unfit or counterfeit notes.

But a more recent development is large language models for generative AI solutions, that can assist in the design of banknotes, for example. We originally thought that technology would have a major impact on blue collar jobs, but it is actually the creative jobs it is challenging now.

Q: Great, so that's us out of jobs then!

A: No, that's not my saying. Rather: What you are already good at, you will be even better at with AI. What you aren't so good at, or which you don't like doing, can be helped by AI. That's the way how we look at that. And what we're doing.

As an aside, we had an internal trial to create the future Euro banknote designs with the support of AI, asking us 'what would be the most attractive theme for the next Euro series?' Selecting these to cover every country is difficult – famous people, ancient pillar of culture, and so on. We played with AI in the ideation and merged pictures of prominent composers of different European nations. The results weren't that attractive – a Beethoven style hairstyle with the face of a young Chopin doesn't really work.

But the point is that AI can be used to try out all sorts of creative ideas and can be supportive in the creation process.

As for other areas, we are using the technology that has been developed in

... A Foot in Both Camps

other parts of the G+D Group. IoT, the Internet of Things, is a good example. You can really improve cash logistics with intelligent solutions that track and trace containers.

Additionally, the rise of cash-tech startups is an area of interest. Virtual ATMs and gig economy-driven cash access solutions can help keep cash relevant in the digital age.

If you are really interested in learning about our innovation roadmap and seeing the breadth of our technology development, in both physical and digital currency, our in-house customer event Currency Symposium in July is the place to be for the best insights.

Q: *To conclude, as this is Currency News and our main interest in physical currency, where will cash be in ten years' time?*

A: That's a very good question and one we think about every day.

In my view, cash will remain a crucial part of the financial system. We might see a decline in cash usage at the point of sale in some regions, but overall, cash will persist. As a public form of money it serves a value for society none of the other existing payments methods has. It serves as a financial safety net and as most inclusive, payment method protecting privacy of the individual. Cash is freedom in practice.

There are indications that central banks are playing a more active role in ensuring the long-term viability of cash. And we are likely to see more and more governments regulate for cash, if for no other reason that they secure its functioning in times of increasing uncertainty and crisis.

Finally, psychologists will tell you that a system as complex as payments is an abstract that can only be fully understood by human brains after the age of 12. Indeed, in some case, it may never be understood. The index worldwide regarding financial education is low and in my view cash plays an important role in educating young people in particular on the concept of money. For very young people, you can only understand what you can touch and feel, ie. coins and banknotes.

So cash also plays an instrumental role for our next generation to understand what money is. And we need that.

Counterfeiting and Metrics – the Debate Continues

■ **By Antti Heinonen, External Advisor, Bank of Finland, former Director, Banknotes of the ECB**

In the December issue of Currency News™ I wrote on whether note issuers are keeping ahead of the counterfeits, with an update on the latest counterfeiting data, using as one of the data points the ppm metric (parts per million, ie. the number of counterfeits detected versus the number of genuine notes in circulation). The following month, Duncan Reid wrote about the shortcomings of the ppm as a metric. It is great that the topic has raised debate, and Duncan's article provides the few interesting viewpoints, which Currency News has invited me to comment on.

I fully agree that ppm as a metric has shortcomings to which I also referred in my December article. Because of these shortcomings, the counterfeit experts at the European Central Bank (ECB) were not satisfied with its use as a metric in the early days of euro banknotes, and we tried to find another one. Therefore, we asked the ECB's statisticians to develop a metric which would better represent the transactional use of euro banknotes, to which the number of counterfeits could then be proportioned.

In spite of their best efforts, the statisticians were in the end unable to find a trustworthy metric which would be also feasible to compile. Accordingly, the topic and concern are not new, and Duncan's arguments regarding the transactional use of banknotes are valid. However, as said, it is challenging to find another metric.

Duncan suggests two measures to make ppm more representative.

The first one is to have a better indicator of transactional use of banknotes, referring that in case of some currencies the transactional use is only some 20–25% of the notes in circulation. In that respect he proposes to use cash withdrawn from ATMs as a better indicator than the notes in circulation. Even if I have used myself also the ratio between ATM withdrawals and non-cash POS transactions as an indicator for other purposes, the concept is not uncontroversial.

Professor Franz Seitz and Guillaume Lepecq do not consider ATM withdrawals as a good proxy for cash transactions, because other sources of cash include bank branches, cashback and cash-in-shop.¹ They referred to the ECB study on the payment attitudes of consumers in the euro area (SPACE 2022) according to which 72% of cash was sourced from ATMs in the euro area, with figures ranging from 52% in Germany to 89% in

Cyprus. And these percentages change over time, as the ECB's more recent study (SPACE 2024) shows.²

Furthermore, these figures refer to countries where most people have a bank account, not to speak of countries where a significant part of the population is unbanked.

More importantly, as mentioned in the December 2024 article, counterfeits are not evenly distributed between various denominations, and therefore it would be better to count ppm per denomination. The question would then be, what kind of metric should be used for those denominations which cannot be drawn from ATMs?

In many countries commonly only one or two denominations can be drawn from ATMs, and the denominational ppm can be higher in case of non-ATM denominations. Therefore, the Reserve Bank of Australia, to the detailed studies to approximate the size of transactional cash, Duncan refers, seems to prefer to publish the ppm per denomination instead of using another metric based on their studies.

Duncan's second measure to make ppm more representative is to include bulk seizures in the ppm calculation. He uses as an example the figures published by the Bank of England, which show that in 2019 the bulk seizures were even higher than passed counterfeits – exceeding 500,000 pieces. However, one year earlier only 7,000 pieces were seized and the year after 37,000.

The purpose of a counterfeit metric is to create a standard of measurement for decision-making. What kind of basis provides a metric which varies so radically from year to year and provides no trend?

One of the reasons for this variation is that bulk seizures are often based on investigations which take several years.

¹ <https://cashessentials.org/atm-withdrawals-are-not-a-good-proxy-for-cash-payments/>
² https://www.ecb.europa.eu/stats/ecb_surveys/space/html/index.en.html

Autentium – the New Polymer Substrate for Banknotes

Back in May last year we covered the pre-launch at the Banknote Conference of a new polymer substrate from Covestro, and in December the official launch under the name CERTEVO®. It appears we were premature, as that launch referred to the version intended for ID and secure document, not currency.



Covestro has now named the banknote version Autentium®, and will be formally launching it at the upcoming Currency+Identity conference in Milan.

Autentium is a thermoplastic polyurethane which is created through extrusion, during which the addition of white pigments (or, potentially, other colours) take place as opposed to the route for other polymer substrates, which are coated through opacification. No surface printing is required either before or after printing.

According to Covestro, Autentium has four specific advantages over rival polymer products for banknotes on the market.

First is exceptional printability, supporting intaglio and offset, and enabling embossed structures and therefore tactile security features that differ from traditional paper and existing polymer substrates.

Second, no coatings or primers are needed, streamlining the printing process and improving durability.

Third is Autentium's water and stain resistance: the polymer absorbs only minimal moisture, which contributes to a low static charge while at the same time being resistant to contamination.

And fourth is advanced laser engraveability, with Autentium allowing precise micro-engravings, providing advanced anti-counterfeiting measures and enhancing currency security.

In addition, as a single-polymer solution, Autentium is fully recyclable, while high tear propagation resistance and ink adhesion help extend the lifespan of printed currency, thereby – in both cases, reducing the environmental impact of banknotes and conserving resources.

... Counterfeiting and Metrics

Furthermore, the calculation of the number of seized banknotes is not standardised. The law enforcement may include not only finalised banknotes but also the raw materials from which banknotes could be printed, which might provide a lot of inconsistency to the figures.

Whatever metric is used, it is important that it gives a good understanding of the trend of counterfeiting regarding a particular currency. Payment habits change

radically only exceptionally, like recently during COVID-19 pandemic, but seem thereafter again to have gradually stabilised. Therefore, even if ppm as a figure does not give the right level of counterfeiting it can be useful in showing the trend.

In conclusion, Duncan Reid has raised a valid point. We need representative indicators to follow the rapidly changing cash ecosystem in all respects. More about that in a forthcoming issue of Currency News.

Currency Data Now Available on Tap

Data both allows and creates questions. Answering questions generates information. Information allows decisions and actions. Without accurate, relevant, reliable, consistent, standardised and timely data, creating and delivering anything is hard, particularly change.

With that in mind, Reconnaissance International has created two new databases for banknotes and coins, with a third in preparation. With an encompassing name of DataVault, DataVault Banknotes and DataVault Coins are now available for use by the industry. These contain information, and images, of every denomination in circulation today.

How is DataVault new?

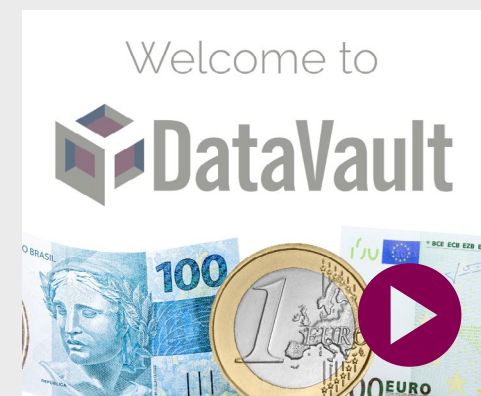
While there are databases available for banknotes and coins already, DataVault Banknotes and Coins are fully updated each month by industry experts, they come with a flexible and convenient search capability, they are fully downloadable, and each licence comes with unlimited access.

The coin data is presented using the same platform, but containing very different, coin specific information.

In both cases, the ability to search, sort and save by denomination, by country or through multiple categories, allows information on features and trends to be easily identified and compared, in mere minutes.

DataVault Cash will be introduced later this year, containing banknote and coin data on cash in circulation, organised by denomination.

Please contact John Winchcombe (john@recon-intl.com) for a demonstration of DataVault Banknote or Coins, or visit datavault.reconnaissance.net/contact-us to trial the software.



HSP First Time in Switzerland – Why Did it Take So Long!

The 2025 edition of the High Security Printing™ EMEA conference was located, for the first time in its history, in Switzerland, in the picturesque city of Basel. The sell-out event attracted 265 delegates, from 117 organisations spanning 44 countries. 38% of the organisations were from government (central banks, issuing authorities) or state printworks.

The first day of the event was handed over to masterclass workshops that addressed two of the major issues facing the industry at the moment – the impact of AI in secure documents, and optimising the cash cycle in a changing payment environment.

During the two-day conference, nearly 40 presentations were delivered, with the programme comprised of six focused sessions split evenly across currency and identity documents in the EMEA region.



The currency landscape

In addition to its thriving tourism, pharma and engineering sectors, Switzerland is renowned for the integrity of its banking system. So, it seemed fitting that the conference welcoming addresses from the Swiss National Bank) and BIS (Bank for International Settlements) made reference to the network of companies operating in the banknote and ID sectors as witness to Swiss innovation.

In his opening presentation, the SNB's Beat Grossenbacher also spoke about the new Swiss series, with its theme of 'Switzerland and its Altitudes'. The design process has recently started, although it won't be issued until 2030 at the earliest.

One of the major companies operating in the currency sector is Swiss-based Koenig & Bauer Banknote Solutions (KBBS). Sebastien Dufey from the company spoke about modern banknote production, focusing on the benefits of selective intaglio, KBBS's new AKTINA production approach and a new foiler based on its partnership with Gietz.

Another of the major Swiss suppliers is SICPA, whose Michael Hans and Olivier Lefebvre presented on why intaglio

remains the backbone of the security and performance of banknotes in circulation (and hence why it is used on over 90% of banknotes). The tactility that comes from intaglio is the most evocative sense and easy for people to recognise. The high pressure and heat used in the intaglio process compacts the paper fibres, creating a more resilient banknote.

Reference was made to a new product, CUPSIA intaglio, that is coming out soon. This combines digital and physical.

Innovation in design

PWPW presented its new 'MEADOW' series of specimen notes, including an interesting use of 'registered' threads with the colour of the thread reflecting the artwork in the background, eg. brown thread was used over an image of soil, in the next window a green thread was used behind stems of plants, and the next window showed red thread around flowers.

Kenya's upgraded series from G+D was presented by Evans Muttai. Evans spoke about Kenya and recent changes in the constitution that allowed this upgrade to take place. The whole project, including production, took six months to complete.

Phil Holland led Komori's presentation covering differences in Western approaches vs Asia. Different cultures see things differently, and Komori's approach to what it does is also influenced by this with its Kando culture, 'going beyond expectations'.

Barna Barabas of Jura presented the six stages of designing a banknote – creating the concept design, the detail of designing for the offset and intaglio printing processes along with the dynamic elements and designing for quality and for mass production. He also introduced Jura's new Pukas house note, produced with KURZ, KBBS, Hungarian Banknote & DIPA, to demonstrate its work.

Miguel Lopez of Banco de Espana updated delegates on Neurocash®, described as an AI tool for the cash cycle, used to add assurance that designs will work for the public.

Dr Adrian Heuberger-Lewerenz from Bundesdruckerei provided a designers' perspective of banknote design. The starting point being that each banknote is an original piece of art and moved

on to the importance of holistic design; the sum being more than the individual parts. While this presentation verged on the philosophical at times, the idea that a good story helps draw people in and to remember, and therefore recognise, an original, was convincing.

Sustainability to the fore

A series of presentations then covered the ever-present theme of sustainability.

Orell Füssli (OFS) has created a software platform that evaluates the environmental impact of a banknote's design (BEES® – Banknote Environmental Evaluation Software) with, thus far, 17 key performance indicators, and enables central banks to include sustainability in their assessment of security and cost considerations (see CN October 2024).

Hueck Folien aims to have reduced its environmental impact by 30% since 2020 and to achieve an ecological product by 2035. It is the first company to have a supply chain for high quality recycled aluminium, achieving a purity close to 100%. It has its own in-house circular recycling system for industrial aluminium scrap. Recycling aluminium has allowed 85% CO2 savings, reducing its CO2 footprint reduced by 13% to 3,629 tonnes. Hunkeler's market analysis finds that 30% of banknotes are on mixed substrates, 10% are fully on either polymer or composite substrates and 60% solely use cotton paper. Separation of materials at the point of destruction is key if those materials are to be recycled. Hunkeler has concentrated on effective separation solutions, reducing energy consumption required for destruction and compaction and creating a dust free environment.

The European Central Bank (ECB) has started the design process for a third series of euro banknotes (see page 15). Antonio Arrieta's presentation covered the ECB's design approach for durability and recycling looking across the whole life cycle. It has used Eco design tool based on the Product Environmental Footprint tool from the European Commission.

Latest in security features

In the session on security features, Oberthur presented on how banknotes have always triggered emotional responses in people. This job is now easier with the option to add movement to banknote. The presentation went on to introduce Oberthur's Anima™, based on Rolling Optic's microlens technology used in a security thread, which is now being used in Lesotho's new 20 maloti banknote. Oberthur are now adding magnetism to the thread to give it a machine readable functionality.

Best in Design and Innovation at EMEA Awards

This year's Regional Banknote the Year Awards for EMEA were presented at a special ceremony during the HSP conference dinner in the traditional Safran Zunft restaurant in the heart of Basel's charming Old Town.

Awards were made for three categories – Best New Banknote, Best New Banknote Series and Best New Commemorative Banknote, with the UAE, Kenya and Eswatini all receiving recognition.

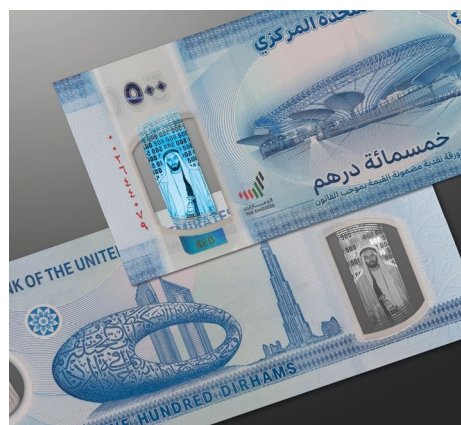
In an additional category, held for the first time last year, there were also awards for the Best New House Note – with Hueck Folien, the Printing Works of the Bulgarian National Bank and Oberthur Fiduciaire sharing the honours.

■ Best New Banknote

The 500 dirham (AED) banknote from the Central Bank of the UAE was the winner of the Best New Banknote Award.

This polymer-based banknote, the fifth in the UAE's new all-polymer series, was printed on De La Rue's SAFEGUARD® substrate by Oumolat, and showcases the UAE's vision of leadership in climate protection and building a sustainable future.

Advanced security features include a multi-coloured, registered KINEGRAM COLORS® stripe from KURZ, which is applied over a large window in the polymer substrate and a second window with a portrait of the late Sheikh Zayed bin Sultan Al-Nahyan. A similar stripe featured on the AED 1,000, which was issued in 2022 and won the Best New Banknote Award in 2023.



■ Best New Series

The award for the Best New Series went to the Central Bank of Kenya which, in August 2024, released an updated series of the Kenyan shilling (KES), having taken steps to guarantee security of supply by procuring the new banknotes from Giesecke+Devrient.

The full series comprises KES 1,000, 500, 200, 100 and 50 banknotes, with the same design as the notes they replace but with enhanced security in the form of Louisenthal's RollingStar® i+ thread on each of the denominations. The three higher denominations – the KES 1,000, 500 and 200 – utilise the ZigZag dynamic movement effect, while the two lower denominations – the KES 100 and 50 – utilise the Crystal effect.



Additionally, the banknotes feature the use of iridescent bands with UV for each of the denominations, while dual colour fluorescence is also maintained as a secondary level security element against counterfeiting.

■ Best New Commemorative Banknote

The Central Bank of Eswatini (CBE) commemorated its Golden Jubilee last year with the issue of a 50 emalangi 'Green Banknote'. The new note was launched by HM King Mswati III, whose portrait appears on the note, as it does on all the country's notes.

The new note is similar to the circulating version issued in 2018 but features a magenta-to-green RollingStar® i+ thread from Louisenthal on the front, along with a RollingStar Patch with a special flip effect in colours that match the thread, replacing the green shield and spears on the circulating version.



The Golden Jubilee celebrations where the note was launched were held at the CBE's new Green Headquarters, which are currently under construction. According to the CBE, both the green banknote and the new green building align with its strategic initiative of 'Greening the Central Bank.'

■ Best New House Note

Competition was intense in this category, with a record number of nominations. There were three winners in total, two jointly for the Best New House Note and one for the Best New House Note Series.

One of the joint winners was the Ocean Dollar, created by Hueck Folien to demonstrate its eco-friendly commitment and credentials. Inspired by the hidden depths of the ocean, the note includes a number of recycled components, including aluminium, paper and PET.



The micro-optics Optomove® security thread is made from recycled PET and aluminium, achieving 53% CO2 savings through the raw material used. The Reef foil stripe, featuring optical nanostructures and Trilumic®, is also made from recycled PET and aluminium, achieving 26% CO2 savings.

The substrate, EcoBreath® paper, was developed by BP Security in partnership with Casa da Moeda do Brasil, and allows the recovery and reuse of fibres from banknote waste to produce recycled security papers for banknotes and passports.

... HSP First Time in Switzerland

Regula presented on magneto-optical technology for banknote examination. Regula provides the ability to design such features better, to manage their quality in production and to authenticate them.

Ian Smith of KURZ presented what he described as the Agile Kinegram®, consisting of the wide range of movement and colour effects in different forms. He went on to introduce a new product which has an in-house working title of Kinegram Vivid, which offers a three dimensional, colour changing effect with movement.

Next generation features and platforms

The final session on technology and innovation included a presentation from KBBS on 'Cash for Good' and how it is sponsoring an educational platform – BeeSmart – to improve financial literacy among communities where digital banking is only the minor share.

Mark Deakes of the International Association of Optical Technologies (IOTA), newly-rebranded from the International Hologram Manufacturers Association, took delegates on a journey through the range of 13 classes of optically active features that the expanded association now supports.

Carveco produces software that enables the creation of products that have an element of relief in them. Robert Newman explained about how their embossing software is harnessing AI for design. Whether its strength lies in the initial creative stage or refining concepts or adapting production techniques, the technology offers a powerful tool for designers.

Alexander Brennan from the University of Manchester was accompanied by Gary Spinks from Security Fibres to share a presentation on how they have developed a new chemical that fluoresces under UV light and retains this for a limited period even after the light source is removed.

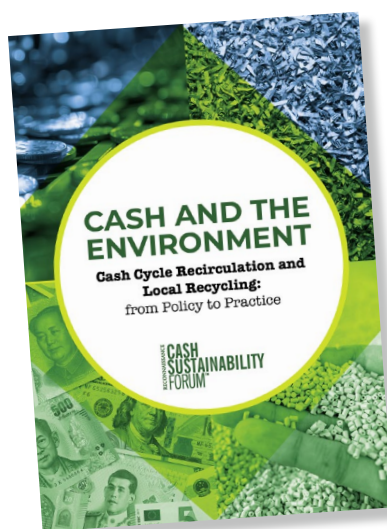
(A number of these innovations will be covered in future editions of Currency News).

The next HSP EMEA will be held 2-4 March in either Namibia or Kenya. In the meantime, the sister event HSP Latin America will be taking place in Rio de Janeiro, Brazil from 9-11 June, and HSP Asia from 1-3 December in Kuala Lumpur, Malaysia.

Managing the Cash Cycle Better

A new white paper investigates how cash management is changing and best practice for optimising efficiency, thereby reducing the cost and environmental impact of cash.

Written by Reconnaissance International (co-publishers of Currency News™) and Paul Blond of the Blond Group, with help from the ATM Industry Association (ATMIA), the paper focuses on what happens to cash once it has been issued, because that is where the majority of the environmental impact of cash occurs. It draws on interviews and research with 24 organisations from five continents and every stakeholder involved in the cash cycle to offer case studies and examples of what is being done and to what effect.



What is changing?

Recognising that every country is different, the paper is not prescriptive but offers options and alternatives through a structured approach. The paper starts by considering what is changing and why the paper is needed. It touches on who should lead when it comes to sustainability and argues that although central banks have both direct and indirect levers of control, in reality, all can play their part.

Inevitably the cost of the cash cycle is at the heart of these chapters. Different business models, and therefore different cost structures, apply depending on how much is done by the central bank and how much has been outsourced. As payment behaviour changes, so does the profitability of providing cash services.

Levers of control

Central banks can use regulations and penalties, and offer incentives, as part of their tool kit of cash management options.

Off-balance sheet arrangements in particular are a useful tool used by some

banks, and perhaps with the option of extended use in the future.

The rise of recycling

Cash handling technology is also changing the cash cycle. Some is still in its infancy, but automation is now well established and being increasingly adopted, along with better collection and analysis of data, as a response to cost pressures, fewer bank branches, more co-ordinated cash management and more.

The result is more cash recycling outside of cash centres and even bank branches, making cash usage and cash management more remote from the traditional central bank levers of control.

Learning from others

The paper ends with two chapters dedicated to case studies. First is a chapter with country case studies considering central bank initiatives. Second is a series of industry case studies to understand what cash management companies are doing.

A series of annexes provide details about everything from banknote design optimisation, getting ATMs to net zero, different central bank cash cycle models and how they have been decentralised, central bank off balance sheet relief scheme options and recycling legislation approaches.

Pause and reflect

At the very start of the paper, immediately after the Executive Summary, is half a page with four bullet points of actions which will have the biggest impact. If you are short of time or want a first status check of your own work, start there, says co-author John Winchcombe of Reconnaissance.

Otherwise, this is an attempt to capture a change (namely payment behaviour), see the impact on existing business models and to consider the challenges this can bring, and to invite you to compare and contrast your position with some of the cash handling models that exist. It offers changes being made by some central banks and cash industry players and shows how some are changing the levers of control in response to change.

The white paper is free to download and is available at <https://reconnaissance.net/cash-and-the-environment/>.

Currency Conference Introduces Updated Agenda Topics

The 2025 Currency Conference is returning to Bangkok, Thailand, from 26-29 May 2025. Conference organiser Currency Research expects to welcome nearly 400 delegates from 70 countries, including 70 central banks and 150 organisations in total. At the time of publication, nearly 50 central banks have already registered for the event.

The Currency Conference is described as the premier event for the sector, where senior-level central bankers, printworks representatives, and leading industry suppliers gather to discuss the most vital issues around currency policy, regulation, and innovation of the whole cash cycle.

Working in coordination with the event's Advisory Committee, Currency Research has refined and updated the topics for the program. The theme this year is 'Panta Rei — Currency in a Rapidly Changing World,' with three high-level topics — adapting to changes in cash usage, sustainability, and new technologies — serving to anchor conference discussions. Detailed topics include:

■ The Changing Roles of Cash Cycle

Participants: With evolving consumer behaviours impacting the roles of traditional cash cycle participants, this session will explore who is responsible for maintaining an efficient and effective cash cycle.

■ Regulation to Protect Cash:

The focus here will be on the various regulatory approaches best suited to guarantee access to and acceptance of cash.

Ready for the Next Crisis: This topic will explore how cash, in the face of declining usage at the point of sale, can be preserved as a critical lifeline in the event of disruptions to digital infrastructure.

■ The Risk of Systemic Failure:

This session will examine whether contracting markets, shrinking revenues, and declining levels of competition and innovation could result in systemic failure and what the industry can do to offset this risk.

■ Cash Advocacy and Education:

This session will explore how the industry should be advocating for cash usage to convince younger consumers that non-digital payment methods matter.

The Cash Product, from Cradle to Grave: This topic will explore ways to make the entirety of the cash cycle more

sustainable, focusing on achievements to date and work yet to be done.

■ Cash Logistics and its Significant

Carbon Footprint: This topic will look at how cash can reduce its sizeable carbon footprint and who will fund the necessary investments.

Artificial Intelligence: Will AI change everything? This topic examines the risks and opportunities for the cash industry resulting from the rise of AI and robotics.

Quantum Computing: Could a 'cash renaissance' result from quantum computing-induced security breaches? This topic will explore this question and how the cash industry should prepare.

Digital Currencies: This session examines the extent to which retail CBDCs and private digital currencies may impact the retail payments landscape and whether they could erode cash's traditional function as a store of value.

Also scheduled is a pre-event central bank executive roundtable. Led by the Five Nations Group of central banks (Bank of Canada, Bank of England, Banco de Mexico, the Federal Reserve, and the Reserve Bank of Australia) and with participation limited to central banks and regulators, the closed-door session will explore how central banks can ensure that the provision of cash services to the public remains resilient and efficient.

Other highlights on the Currency Conference program include a cultural tour of Bangkok, a tour of the Bank of Thailand's Note Printing Works, and the always memorable conference dinner.

The International Association of Currency Affairs (IACA) also has several items on the agenda, including the induction of new members into the IACA Hall of Fame and the Excellence in Currency Awards.

The 2023 Currency Conference was the 20th edition of the event since its inauguration in 1992. In another milestone, Bangkok, site of the 2007 conference, will become the first city in the event's history to host a second time.

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... EMEA Awards

The second joint winner was the Printing Works of the Bulgarian National Bank (BNB) Corp, which produced its first ever house note to celebrate its 30th anniversary in 2024.

The intricately designed and highly complex note is broadly themed on butterflies and maths. The front features a portrait of Edward Lorenz — mathematician and meteorologist — who discovered chaos theory and whose description of the Butterfly Effect (the idea that small changes can have large consequences) provides the accompany visual graphics. The reverse continues this narrative with graphic elements of a butterfly in flight.

The production of the note involved dry and wet offset, intaglio and screen printing, with a diffractive stripe from Demax featuring 3D and bas relief effects, a positive/ negative e-motion effect, an achromatic micro engraved portrait, micro- and nano-engineered images and registered demetallisation.



■ Best New House Note Series

Lepidoptery was also the theme of the final, additional house note award — this time for a series, which was made to Oberthur Fiduciaire for 'The Art of Butterflies'.



The theme was chosen as it symbolises the spirit of Jean-Pierre Savare, who took over the company 40 years ago and transformed it into the successful group it is today. The butterflies represented are five species from the famous collection of François-Charles Oberthur that can be seen in the British Museum in London.

The five notes were printed in one sheet with five different designs and five different security threads, among them Anima, Pulsar and Relief, to produce a highly attractive and technically sophisticated set.

China Celebrates Year of the Snake

2025 heralds the Year of the Snake in the traditional Chinese zodiac calendar. In December 2024, the People's Bank of China announced the issue of a commemorative 20 yuan banknote for the 2025 Chinese Zodiac New Year.



Guangzhou Banknote Printing Co Ltd.

The Chinese zodiac cycle accommodates 12 animals, each of which is said to reflect specific human attributes. This is the second note in the zodiac series, and follows the award-winning Year of Loong (dragon) note issued in January 2024. The Bank will be issuing one commemorative note per year to mark each animal in the cycle.

The Year of the Snake banknote is printed on polymer substrate and manufactured by the Guangzhou Banknote Printing Co Ltd, a subsidiary of China Banknote Printing and Minting Corporation.

Guangzhou Banknote Printing was established in November 2013, and is the most advanced and 'intelligent' among the eight banknote printing enterprises under CBPM, boasting cutting-edge equipment, lean management, and intelligent capabilities in the R&D and production of both paper and polymer banknotes.

Alongside the printworks is a factory with unique polymer banknote production processes, featuring a complete manufacturing system from substrate coating, hot stamping to printing, quality inspection, and sealed packaging. It is equipped with five key modules – analysis and testing, optical experiments, material preparation, ink making, pilot proofing, along with 12 functional laboratories and various advanced instruments dedicated to advanced anti-counterfeit material research

and the development and industrialisation of polymer banknotes.

Last year was the Year of the Dragon (Loong). This year's Snake, often referred to as 'Little Loong', was one of the totems of ancient Chinese tribal civilisations and is considered a close relative of the Loong. In Chinese zodiac culture, the snake symbolises wisdom, agility and resilience.

The image of the snake on the front of the banknote was inspired by Beijing embroidery (or Jing Xiu), which is renowned for its exquisite craftsmanship. Distinguished by its use in creating imperial robes and ceremonial attire with strict hierarchical significance, it holds a unique place among Chinese embroidery arts.

At the top right of the central snake motif is a seal engraved with the Chinese character 蛇 (Snake) in seal script. Seal engraving is an art form with a longstanding history in China and holds significant cultural importance. The character on the seal is crafted in the small seal script style of Chinese calligraphy, presented as 'Baiwen' where white script is set against a vivid red background.

Below the central snake motif is a LiveColor® security stripe and transparent window with the design motif of the Chinese character 福 ('fu', meaning good fortune) combined with floral elements in traditional Chinese culture.

The character 福, incorporating the stylised depiction of the Snake, is positioned at the visual centre of the transparent window. It is complemented on either side by plum blossom patterns and cloud motifs, symbolising nobleness, loyalty and good fortune in traditional Chinese culture.

These elements harmonise with the plum blossom design on the reverse of the banknote. With changes in the viewing angle, the security stripe displays dynamic features of red gold alternating with turquoise in the decorative patterns.



The outline pattern of the transparent window is derived from the artistic form of 'baoping-shaped frame window' in classical Chinese garden art. Baoping is a traditional Chinese vessel shape, symbolising prosperity and peace as an auspicious motif.

The reverse of the commemorative banknote features a scene of children pasting Spring Festival couplets onto a wall, inspired by the customary practice of displaying these couplets to celebrate the Chinese New Year and the traditional Chinese painting theme of 'Bai Zi He Chun' (Hundred Children Celebrating Spring).

Spring Festival couplets, also known as 'taofu' (peach wood charms) or 'mendui' (door couplets), are a unique Chinese literary form, featuring two lines of poetry of equal length and rhymed, concise and elegant wording, and are also an important custom for celebrating the Chinese New Year.

They originated from the folk practice of carving god images on peach wood boards to ward off evil, hence the name 'taofu'. Over time, taofu evolved into two main forms: text-based Spring Festival couplets and image-based door gods. As written characters are convenient, flexible and expressive, couplets became more widespread. Pasting them at doors marks the official start of the Spring Festival celebrations.

100 million of the Year of the Snake banknotes have been printed, with sales via online reservations and offline exchanges. According to local reports, huge numbers of people reserved the snake banknotes and many banks experienced long queues as people awaited their turn to obtain the notes.

Note and Coin News

Bahamas' New Crisp Evolution \$1 Green Banknote

The Central Bank of The Bahamas (CBB) has released its new CRISP Evolution \$1 banknote. While the design remains basically the same as its predecessor, the previous note was printed on Giesecke + Devrient's Hybrid™ substrate, while the updated version features its Hybrid ADDvance® substrate.

The new \$1 banknote is the first Bahamian denomination based on an environmentally friendly substrate and, says the Bank, underscores its commitment to more sustainable and resilient banknote options, incorporating innovative materials and processes to minimise the environmental impact of banknote production. (For context, the CBB introduced the original CRISP series in 2005).

The note features a portrait of The Bahamas' First Prime Minister, Sir Lynden O Pindling, as the main illustration on the front. He also appears in the watermark. On the reverse is a depiction of a drum major in full regalia, leading the Royal Bahamas Police Force's marching band.

The principal security feature is a RollingStar i+ 4mm wide security thread with MultiCode (based on 70% recycled polyester). The thread displays a dynamic optical star outline illusion that transitions from a small star to a large star when the note is tilted. The thread also exhibits a

colour-shifting effect, changing from gold-to-green and, when viewed in transmitted light, the letters 'ONE' and '\$1' appear.

A key difference between the new CRISP Evolution and the previous Hybrid version is the substrate, with its core of fibre mix of certified sustainable cotton and FSC® (FSC-C138716) certified cellulose, originating from European forestry. The carrier film for the RollingStar i+ security thread is sourced from a certified recycling circuit, consisting of 70% recycled polyester, thereby transforming recycled plastic waste into a high-quality security feature.

For greater durability, the Green Banknote is wrapped with a PET film, which is thinner than traditional materials. Combined with the recycled content of the security thread, these measures reduce the overall plastic content by 38% compared to the previous Hybrid™ substrate.

Finally, the inks for simultaneous printing are based on vegetable, not mineral, oils.



In Other News...

■ The Bank of Zambia has announced the introduction of a new family of notes and coins, which will be introduced at the end of March.

The banknotes will be denominated in 10, 20, 50, 100 and, for the time, 200 and 500 kwachas. The current 2 and 5 kwacha banknotes are being converted to coins, to join the 5, 10 and 50 ngwee, and 1 kwacha coins.

According to the Bank, the design of the new currency draws inspiration from the country's heritage, featuring elements that celebrate its unique flora and fauna and well-known waterfalls. The banknotes all feature an image of the African Fish Eagle on the front, and a waterfall together with a native animal species on the reverse.

■ The State Bank of Pakistan has confirmed that the country's new currency series will be introduced one note at a time, starting in the second half of 2025. It did not disclose which denomination note would be in circulation first. One of those denominations will be on polymer, and the others on paper.

■ The Governing Council of the European Central Bank (ECB) has selected motifs to illustrate the two possible themes for future euro banknotes. One – European Culture – focuses on shared cultural spaces and prominent Europeans (who include the opera singer Maria Callas, Beethoven, Marie Curie, Leonardo da Vinci, the novelist and Nobel laureate Bertha von Suttner and the novelist and playwright Miguel de Cervantes). The other – Rivers and Birds – focuses on the resilience and diversity of the natural world, with images of the main European institutions on the reverse.

According to the ECB, the decision was based on suggestions provided by two multidisciplinary advisory groups from across the euro area and is in line with the preferences on the themes expressed by more than 365,000 Europeans in public surveys held in the summer of 2023 and in focus groups conducted between December 2021 and March 2022.

The next step will be the creation of a jury and the launch of a design contest, which will be open to designers from across the European Union. This will take place this year. In 2026, the ECB will ask the public

which designs they prefer, based on a shortlist, and is then expected to make the final decision on the new designs.

■ The Central Bank of Armenia has issued a revised 20,000 dram banknote, which features the denomination numeral printed in OVI on the reverse. A similar improvement was made to the 5,000 and 10,000 drams last year.

■ The Reserve Bank of Zimbabwe is working on a redesign of its ZiG (Zimbabwe Gold) banknotes to improve their durability and quality. The new series was only introduced last year, and to date only two denominations – the ZiG 10 and 20 notes – have been issued. But apparently these are wearing out fast.

Other, as yet un-issued (and presumably never-to-be-issued) notes in the series include the ZiG 1, 2, and 5 (for which coins of the same values are in circulation), along with ZiG 50, 100 and 200 notes (which were always intended to be held back to avoid stoking inflation). They all have the same design, with the Chiremba balancing rocks on the front and gold ingots on the reverse.

... Note and Coin News

■ The Central Bank of Russia has announced that new 10, 50 and 500 rubles will be issued in 2028, a part of its new series on the theme of cities and federal districts throughout Russia. New 100, 200, 2,000 and 5,000 ruble notes in the series have already been issued. The new 1,000 ruble was due to be issued in late 2023, but had to be suspended due to a backlash from the Orthodox Church over the inclusion of a former church from which the cross had been removed. A modified version will be released later this year.

According to reports, the 10 ruble had not, originally, been included within the

new series, given there is a coin of the same denomination, but the lower cost of producing notes versus coins is resulting in its effective reintroduction, along with – potentially – a 5 ruble banknote.

■ The Central Bank of Trinidad and Tobago is issuing a new version of its \$100 banknote this September. It will feature the steelpan (the national instrument), instead of the three ships of Christopher Columbus, along with the country's new coat of arms, which was approved by the Parliament this January.

The new note will also, include advanced new security features, despite the existing \$100 bill only being introduced as the first in Trinidad and Tobago's all-polymer new series in 2019. Those features include a larger see-through window with holographic elements and a Bird of Paradise in iridescent ink.

■ The Central Bank of Libya is issuing a new 20 dinar banknote on polymer, featuring a holographic window feature and SPARK Live®. A new polymer 5 dinar note has already been in circulation since 2021, preceded by a polymer 1 dinar note in 2019.

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