

## Future of Banknote Printers Webinar – Questions Answered

This webinar was held March 26, 2025. Our panelists were:

**Marilou Arrends** (CCO for Canadian Banknote Company),  
**Malcolm McDowell**, CEO, Note Printing Australia,  
**Wolfram Seidemann**, CEO of Giesecke & Devrient, and  
**Nikki Strickland**, Group Strategy and Marketing Director

**Richard Wall**, Chairman of IACA moderated the Discussion.

Questions were asked by the participants and those that we were not able to be answered within the time limits of the webinar were as follows. Thank you to the panelists for answering these questions.

The webinar recording can be accessed and viewed from our website under Resources > Webinars/Videos (you must be logged in to access).

### 1. Do you think that the increased use of digital currency by central banks and online payment methods would significantly affect use of cash?

**Nikki (DLR):** *Cash continues to be unique because it is physical in nature and it is already very widely used (it is much more widely used and available than any other type of payment). This means it is difficult to imagine a future scenario where it doesn't play a significant role in the payments landscape, even with digital payments growing. Cash is either number one or an important payment option at the point of sale in every country today (even in Sweden – widely thought of as a cashless nation one in ten payments are still made in cash). Digital payments will grow and this growth may be at the expense of cash transactions, but digital payments can't replace cash everywhere or for every use case. Some "digital payment growth" also relies on cash, as we see with many mobile money networks.*

*Here are some examples of factors that drive banknote demand: people not wanting their data sold for marketing purposes, cultural habits, people wanting the physical reassurance of being able to hold cash, increasing economic uncertainty, mistrust of governments, concern over the threat of cyberattacks, natural disasters, a digital divide meaning that digital payments aren't accessible to all, the ease and human connection of a cash transaction, increasing poverty and cost/taxes associated with digital payments.*

*It's also important we protect cash. Cash ensures every global citizen can pay/trade/save. It protects a person's fundamental right to privacy. It makes the payments landscape more resilience and consequently provides confidence. It provides free-to-use competition to digital payments, which ultimately makes digital payments better. It helps people budget. It is simple and easy to use/save. The act of giving/receiving cash can bring joy. From a central bank perspective, it offers control and, via seigniorage, can even pay for itself / generate money for the central bank.*

**Malcolm ( NPA ) :** Without a doubt, it is.

**Wolfram (G+D) :** Digital currency will influence all forms of payment, primarily digital transactions but also cash. However, the extent of its impact remains uncertain.

## **2. How important does geopolitics play in the survival of banknote printers? Does this pose a threat to the industry through supply chains and markets?**

**Nikki (DLR)-** *Geopolitics have the potential to influence banknote demand both positively and negatively. General geopolitical uncertainty can drive demand for banknotes but can also trigger events that disrupt supply chains and cause delays in fulfilling an order. The industry is only recently out of a major pandemic, which was massively disruptive where banknote printers continued to operate AND also invested in their manufacturing sites and R&D pipelines. Ultimately, we are in a global industry, with a long history of planning ahead to manage the impact of geopolitics and dealing with global supply chains.*

## **3. There are opportunities to think very differently faced with changing behaviour - re-thinking store of value notes, digital interactions at the POS, SPW/private producer alliances, just in time local production, even leasing of notes... However, central banks are conservative. To what extent can printers lead radical change? Is there the appetite for new thinking?**

**Nikki (DLR)-** *Banknote printers should always challenge ourselves to see if we can do things better. Competition will naturally drive some evolution and innovation in our industry anyway. However, a responsible business must balance risks and consider the potential return on any investments made. This means the future of the banknote industry will have some correlation to the actions of our customers. Partnerships, collaborations and long-term supply partnerships unlock the ability of banknote printers to invest more in future products and services. In contrast, cost-driven tenders and limited visibility of future orders comes with the risk that banknote printers can only react in the moment and need to focus on protecting their cost base. The banknote industry and central banks have a symbiotic relationship where it is in all our interests to*

*work together and to make longer-term plans together – this allows us to more confidently invest in the future and central banks to benefit from these investments.*

**Malcolm (NPA)**- *The ability for State Print Works to lead radical change is very limited. By their very nature they are very conservative, risk averse and focused on security printing, not marketing.*

**Wolfram (G+D)**- *Innovation is always an option of minorities. The market ultimately determines the success of a new idea.*

#### **4. How can AI be harnessed to enhance banknote production?**

**Nikki (DLR)**- *We may see future manufacturing machines starting to adopt AI management tools - there could be potential applications for AI in supporting supply chain planning, quality control/inspection and production machine predictive maintenance. Beyond production it may have future applications in counterfeit detection and cash cycle analytics. Many of the potential applications are automated/semi-automated already so there would need to be an investment cost vs potential reward evaluation carried out to ensure AI wasn't simply adding cost and was bringing a demonstratable benefit. AI applications may have a greater benefit in the wider cash cycle, for instance planning cash cycle logistics or aiding law enforcement in finding sources of counterfeits.*

#### **5. If the panelists had to choose the single more important factor in ensuring the future of banknote production, what would it be? Sustainability, security, resilience?**

**Nikki (DLR)**- *As mentioned during the panel discussion it's important that banknote printers have long-term supply partnerships and/or that tenders are set up to help the industry remain viable in the longer-term. All manufacturing business (in all industries, not just banknote printing) run best when they have a steady and predictable demand for their products, when customers pay on time and when payment terms are supportive of the supplier purchasing expensive raw materials upfront prior to production. Our industry tends to have extreme peaks and troughs, which can mean times when new orders are coming in but there is no capacity. Then there are other times when our cash flow needs careful management because we are relatively quiet. The industry tends to experience these peaks and troughs at a similar time. Late payments and/or poor payment terms represent a risk to the industry. Furthermore, the more we can do to plan ahead together and manage the banknote demand phasing to help smooth out the peaks and the troughs then the more we are all able to plan ahead.*

**Malcolm (NPA)** – *Resilience*

**Wolfram (G+D)-** *The most important factor in ensuring the future of banknote production is resilience.*

**6. Is the industry able to point at any use cases across the globe that are remaining (or should remain) the preserve of cash regardless of developments around digital payment channels?**

**Nikki (DLR)-** *Ultimately the payments landscape of a country is more resilient if it is made up of different types of payment types – that way people have choice and there are back-up methods of payment if other methods fail.*

- *Parts of the world with poor / no internet (the IMF predicts this to be 2/3rds of the global population)*
- *On/off-ramps for mobile money payments (cash made up about 40% of mobile money transactions in December 2023 according to GSMA)*
- *People who don't want to trust their money to banks/the government/businesses*
- *People who don't want their payments tracked (perhaps because they don't want their data sold for marketing purposes, or they want to participate in a legitimate protect without repercussions or they are buying a surprise present or they are escaping an abusive relationship or many other reasons)*
- *People needing to budget carefully and wanting to retain control*
- *Instances where digital payments fail*
- *Where financial/digital literacy is low*
- *Cultural or social events where giving physical cash is part of the tradition*
- *If digital infrastructure breaks down – note that renewable electricity may not keep up with demand for more energy + there are specific precious metals needed to support the digital infrastructure that enables electronic payments. Physical cash is used hundreds or thousands of times during its useful life and requires different raw materials.*

**Wolfram (G+D)-** *The value of cash lies in its universal acceptance, and cash cycle stakeholders must work to preserve this. As a physical object, cash holds inherent value that a digital representation of money cannot fully replace.*

**7. We are seeing some advancements in digital printing technology in the production of banknotes, what security and privacy measures could / should be implemented to ensure that digital printing methods do not open new vulnerabilities for counterfeit currency?**

**Nikki (DLR)-** *Ultimately you can think about this like any other security feature development – whatever we introduce that is new for a banknote should be distinctly different from what can be achieved with commercially available equipment or raw materials. If the digital print can be replicated using commercial digital print then it isn't secure. If non-secure digital print is used on part of the banknote then the banknote needs enough layers of complexity (delivered via secure processes, equipment and materials) to ensure the banknote is secure overall. It's worth noting that the public view a banknote holistically – the secure print used in our banknotes today is distinctly different from digital print available commercially, so a commercially printed simulation can trigger a reaction that “something doesn't seem right.” It would be risky to remove the replace all the secure print with digital print and hope that the security features alone would protect the note – our experience is that it is the layers of security features, windows and print + the way that everything is integrated into the overall banknote design that makes a banknote secure.*

**8. Nikki - you referred to forced reduction in CIC as a downward driver. Can you elaborate, and give any examples?**

**Nikki (DLR)-** *I was talking about withdrawing banknotes and/or not issuing banknotes despite there being demand. Sometimes this can be the central bank attempting to calm inflation by restricting banknote demand. Demonetisation in India is another example – you can look at IMF data for cash in circulation over time and see the sharp dip, that then rebounds back to the original trajectory over time. To date historical data shows that any forced/sudden change to cash in circulation returns to its original trajectory. In the minority of countries where we see a sustained decline over time it has happened over a long period of time (e.g. 10 years+) and very slowly. Cultures, habits, infrastructure etc do not change quickly. Even with COVID, where an extreme situation prevented cash from being used, reports such as the WorldPay reports showed an acceleration in digital payments at point of sale during COVID but then (if you track the % of payments value made digitally across a few reports) COVID-acceleration slowed down and there are some countries where the shift towards digital stopped completely.*

**9. Should banknote printers make more of an effort to promote and market the use of cash? Electronic payment companies have huge budgets on marketing e-payments?**

**Nikki (DLR)-** *This is best done by joining forces in order to maximise impact (via e.g. the ICA or IACA). In 2017, Visa launched a program offering \$10,000 incentives to 50 U.S. restaurants and food service businesses to encourage them to go entirely cashless. In the first half of 2024, Visa, Mastercard, and associated credit card industry trade groups collectively spent \$21 million lobbying against increased competition in the industry. The industry can't compete against this, so we have to be joined up and smart to maximise the resources we do have (and hopefully to do this with the support/input from central banks). At present there is a risk that digital is seen as 'new' and cash is seen as 'old' when this isn't the case. Cash is technically highly advanced and gives the central bank a good level of control (they issue it and set the standards around managing it). It doesn't rely on software/transfers/approvals going through another country like many of the digital payments.*

**Malcolm (NPA)-** *Central banks are critical to the promotion of cash, rather than the printers. Central banks have the ability to ensure cash remains an acceptable payment method in all transactions, and that the public have access to cash - such factors will outweigh any marketing campaign.*

**Wolfram (G+D)-** *This is why the industry established the ICA, with many key players also supporting IACA. We encourage backing both organizations.*

#### **10. In what ways will global inflation trends and economic instability (ie war) affect the design and printing of new banknotes?**

**Nikki (DLR)-** *Although inflation can impact the opportunity cost of holding cash we can see that central banks are reluctant to introduce new high value banknotes and, over time, this leads to banknotes working harder (imagine it used to cost \$20 for a meal, but over time that same meal costs \$50 but you don't have a \$50 note and so end up paying with two \$20s and one \$10). Economic instability can lead to hoarding of cash. If banknotes are working harder and/or if more notes are hoarded then this can drive up banknote demand. Specific events, like war, can lead to a delay in a new banknote design. There are always upward and downward forces simultaneously impacting banknote demand.*

**Wolfram (G+D)-** *Research shows that all types of crises tend to increase the demand for banknotes.*

#### **11. Growth in cash requirement has come down. But there is a lot of consolidation, acquisition, and new infrastructure development. How do you see this contradiction?**

**Nikki (DLR)** -Cash in circulation is still growing at 5% per annum, which leads to more banknotes being needed each year. New banknote designs can drive up demand temporarily (perhaps requiring additional stock versus a standard reprint). The replacement rate of cash is a bit more variable – if there are more digital payments in a country then cash wears out less quickly (if all other things are equal). However I think we have to be careful about extrapolating point of sale data in some countries across the entire world for all use cases for cash. Payments can happen that aren't point of sale payments. Rural environments use cash more. Elderly and vulnerable groups use cash more. Natwest in the UK has recently found that young people are the demographic most likely to use cash “at least some of the time” and have market research suggesting there is a generation going back to basics. Mobile money payments will count as a digital payment even if cash was used to load up the mobile money account, so is an example of how payment reports can tend to underestimate cash usage (pre-paid cards and vouchers may also count as digital payments but have been bought with cash). Cash usage can increase in absolute terms even if the % of cash, by value, at point of sale appears to be decreasing in some countries. The reality is that our industry and the drivers of our industry are complex and there can be considerable variation in usage/needs between countries (even between neighbouring countries).

**Wolfram (G+D)**- CiC continues to grow, while existing infrastructures are reaching capacity. For cash centers, this drives the need for expansion, and for printworks, political factors are fueling the growth of printing capacities.

## 12. Is a differentiated niche strategy still credible?

**Nikki (DLR)**- With the right niche and execution!

**Malcolm (NPA)**- Yes and there are examples currently within the industry.

**Wolfram (G+D)**- I'm happy to discuss alternative strategies.

**13. Digital payment is on the high. There was system failures with digital or online payments in the UK. People had to go to the ATM or find other means to access cash. So, I do think that perhaps there is the need to have both physical cash and digital but in a very sustainable way. The printing industry and banknote stakeholders have a lot to bring about this innovations. We see some countries using polymer banknotes? Should this be harmonized globally as a security measure from counterfeiters?**

**Nikki (DLR)-** *There are many benefits to polymer banknotes, which is why there is a significant trend towards polymer among central banks upgrading their banknotes. Ultimately though a central bank should consider the best specification and security features for each of their denominations based on their banknote needs and how they see the threats to their banknotes evolving with time. We'd never advise selecting a security feature or a substrate just because another country has selected it because their cash cycle and counterfeiting threat may be very different to your own.*

**Wolfram (G+D) -** *Neither polymer substrates nor plain paper substrates are sufficient on their own to protect banknotes. Security features must be integrated into (paper) or printed (polymer) on the material. From a sustainability perspective, longevity is the key factor, which can be achieved with both polymer and paper hybrids that consume less plastic.*

#### **14. What Banknotes printers are doing to make cash more attractive to younger generations? what's the most important for them? Security features, cash availability, design ?**

**Nikki (DLR)-** *As mentioned in a previous answer, Natwest in the UK has recently found that young people are the demographic most likely to use cash "at least some of the time" and believe there is a generation going back to basics. In some countries we are aware of younger generation wanting to take part in peaceful protests without fear of repercussions and so preferring cash. The #cashstuffing trend of using physical banknotes to aid budgeting involved younger generations. As banknote printers there are only certain things we can control – for instance we can ensure high quality banknotes. If we're designing the banknotes as well then, working with the central bank, we can ensure an attractive, engaging and functional design. The central bank will set the clean note policy that will determine the quality of the banknotes the public are handling, which may influence the perception of cash. Broader macro-economic factors (beyond what banknote printers can influence) may then make cash more or less attractive. As banknote printers our biggest efforts are probably via the associations like the ICA and IACA, as well as via conferences such as the GCF. I do believe there is more we can do here and we'd welcome the opportunity to engage with central banks more on this topic.*

**Wolfram (G+D)-** *The value of money lies in its quantity. For cash, this means that trust is built through attractive design and strong security features, but ultimately, its availability is the most important factor for younger generations.*

#### **15. Is the mindset 'cash is over' creating a self-fulfilling prophecy?**

**Nikki (DLR)** - *The death of cash has been talked about for decades and cash remains resilient today. I think we have to be careful about thinking that digital = good & new whereas cash = old and bad. The technology in banknotes continues to advance – there is world leading optical science underpinning our security features. Cash fulfils a unique function that other payment methods can't replicate and has a fundamentally important role to play into the foreseeable future. The co-existence of cash and digital payments ultimately creates a landscape that potentially unlocks the best of both worlds and provides choice. I think we need to celebrate the Currency Issuing Departments more – these are staffed with people who understand economics and monetary policies whilst also having applied skills related to the practical management of a physical supply chain and the project management skills for a new series. “Cash is over” discussions do them a disservice because they are working on a product that will be relevant for a very long time. “Cash is over” discussions also do our customers a disservice because it can come from a very European/America/Australian/UK perspective. It also means we keep on going over the same themes again and again – we should be able to have more interesting debates! We should be talking more about creating resilient payments systems and the role cash plays here. We should talk more about optimal cash cycles and what to aim for in order to have efficiencies and stability. We should talk more about the control that central banks have because of cash and why cash is a relevant modern payment tool.*

**Wolfram (G+D)**- *You're right, it's not the correct mindset, and in fact, cash is far from being over. That's why I never use the word "still"—cash remains the most widely used payment instrument worldwide.*