

INFOSECURA



Security Printers 2018 in Dublin: speak up for cash

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Cash matters



This year is the 10th anniversary of the beginning of the financial crisis, which in part was caused by low interest rates and a rash of lending to US "subprime" borrowers - people with poor or non-existing credit histories. It affected the USA and Western Europe and led to the collapse of several banks. In the following year, all three of Iceland's major privately owned commercial banks defaulted, leading to a severe economic depression in Iceland itself and to a run on deposits in the Netherlands and the UK. Savers from these countries had been attracted to high interest rates offered by Iceland's banks and now saw their deposits vanish. Some years later, in 2012 to 2013, it was the turn of Cyprus to be hit by a banking crisis, involving the exposure of Cypriot banks to overleveraged local property companies and other factors. After a €10 billion international bailout, Cyprus had to close the country's second-largest bank, the Cyprus Popular Bank and impose a one-time bank deposit levy on all uninsured deposits there, and on around 48 per cent of uninsured deposits in the Bank of Cyprus (the island's largest commercial bank). Apart from Cypriots, the losers were often wealthy citizens of other countries, many of them from Russia.

These sorry tales are a reminder that banks can and do fail and the money deposited there can be at risk. They also put into perspective the current lack of wisdom of those who advocate a cashless society. There are two articles in this issue that deal directly with cash, or the eagerness of some financial operators to get rid of it. They also emphasize that bank deposits and all other cashless operations are a claim on a private company, while cash is a claim on the central bank, i.e. the state, which cannot default (unless it ceases to exist, which has also happened).

Both these articles and the one on the launch of the "Cash matters" campaign by the International Currency Association are indicating that there are strong voices that speak for the continued role of cash. But one subject remains largely unsaid, that of contingency. Yes, banks do fail, but very rarely, but cashless financial operations depend on electronic technology behaving in the way it is supposed to behave. We have not seen any large-scale hacker attack on the banking system, as cyber criminals do not want to destroy the system, but to milk it. But we cannot totally disregard the possibility of hostile cyber attacks from "state operators" against one country or another. And as the recent "WannaCry ransomware" attack, that affected 230 000 computers in 150 countries showed, there are no borders in the cyber world. It is of course ironic that the ransom demands in the "WannaCry" attack asked for payment in bitcoin - rather than in large denomination banknotes.

Our industry is used to staying one step ahead of those who want to abuse the system. And we have something tangible to offer that can be seen and felt. For banknotes trust is essential, but how much more essential is it for non-cash, where trust can prove to be very fragile? ■

The Editor



A lesson in Light

The second note in the new Swiss banknote series is as interesting and complex as the first one.

(Image: Swiss National Bank)

Although the Swiss National Bank took great care to inform the public about its new banknote series, which had the overall theme of “multi-faceted Switzerland”, the second note in the series, the 20 Swiss Franc, was only shown to the public one week before it was released for circulation on May 17.

With 70 x 130 mm it is slightly smaller than the Sfr 50 note, but also, by 7 mm, a little smaller than the Sfr 20 note it replaces. Swiss banknotes increase in size from the lowest denomination to the highest, but all will lose some length in the new series. Just as in the first note of the series, the Sfr 50, the design of the new note is complex and very clearly a part of an overall design idea. While the dominant colour of the previous note was green, the new Sfr 20 note is predominantly red. There are several prominent design features, albeit in a different form, that repeat those, found on the Sfr 50. Most obviously there is the hand, which in the Sfr 50 note held the seedhead of a dandelion and in the Sfr. 20 note holds a prism through which a light beam diffracts into different colours. This also represents the “Leitmotiv” of the note; light, taken as a symbol of creativity and as an affirmation of Switzerland as a place of culture and art in many different domains.

The second familiar feature is the globe, which here is overlaid with astronomical constellations, again to symbolize light. Both motifs are printed in intaglio and the globe uses Sicpa’s Motion OVI. The background of the note is reminiscent of a kaleidoscope in which colourful patterns are produced through reflected light.

The “light” Leitmotiv is carried through to the back of the note, from butterflies, whose wings change colour in different light, to a picture of the Piazza Grande in Locarno, where during the film festival films are screened outdoors. The lines at the back of the Sfr. 20 note portray an iris, which regulates the amount of light entering the human eye. To take all this in, requires more than a single quick look.

As all the other notes in the series, the new Sfr 20 has 15 level-one security features and some seem to aim not only at security, but also at educating the public. In the security stripe for example, one can see a map of Switzerland, night-time light emissions represented by circles, the distance between various celestial bodies and the earth, and the number 20. When tilting the note slowly backwards the outline of Switzerland and the night-time light emissions appear in rainbow colours. In addition to this, little shining Swiss crosses are visible inside the number 20.

As the note is printed on Landqart’s Durasave paper/polymer/paper substrate, there are two features that make use of windows and half windows. On the top of the note there is a full window in the shape of a Swiss cross, although overprinted with the background design. When holding the note up to the light, the cross turns into a Swiss flag, because a square of paper on the reverse side has been removed, making a half window and therefore the Swiss flag. A similar technique lets a glittering security stripe appear in a triangular half window. When looked against light, the whole stripe becomes visible. Among the other security features there is a “micro-perfed” Swiss cross, the same size as the window, same again as a tilt feature and also as a see-through feature. There are also two watermarks, a Swiss cross and the globe which also appears on top of the note as a UV feature.

The new Sfr 20 note is a highly interesting, complex and challenging note. Perhaps to really appreciate it, it should be used as the basis of a lecture on art, philosophy or culture. It is also so full of features that any would-be counterfeiter surely would lose heart, well before starting. Perhaps that was the intention of the SNB. However, it is also obvious that some of the security features, such as the watermarks and the window, got a little lost among the competition. ■

CASH SKIRMISHES: TALKING BACK

Yves Mersch, Member of the Executive Board of the European Central Bank, confirmed his support for the continued use of cash, as to be expected, in very measured tones. The Senior Financial Services Officer of the European Consumer Organisation was more forthright in his defence of cash.

Amidst the continuing lobbying in favour of the abolition of cash, it is heartening to see that central banks stand up for its continued use. Apart from credit cards, online transfers and direct-debit payments, and now smartphone-enabled digital-payment solutions and mobile wallets, we can expect further and potentially disruptive innovations like distributed ledger technologies, which indicate that further and possibly fundamental change to payment systems may be on the horizon. There seems to be, and we hope there will remain, one constant in this cacophony of payment choices: cash.

MEASURED WORDS FROM THE ECB

Recognizing the convenience of cashless systems, Yves Mersch, Member of the Executive Board of the European Central Bank, said in a speech on 28 April, that in spite of all the fashionable alternatives, to write off the role of banknotes and coins in the economy would be a mistake.

There are a number of studies, he said, that lobby for the abolition of cash. Advocates of a cashless society tend to fall into three distinct camps. The first camp, the alchemists, wants to overcome the restrictions that the zero per cent interest rate (the zero lower bound -ZLB) imposes on monetary policy. The second, the law and order camp, wants to remove the ability to use cash for illicit means. The third camp, the fintech alliance, expects to save money by eliminating the high storage, issuance, and handling costs of cash - and also to make money from cashless transactions.

The arguments against cash do not stand up to scrutiny, Mr. Mersch thinks. To counter the alchemists, he admits that in an environment of very low interest rates, the conduct of monetary policy becomes difficult. However, it has been shown that negative interest rates have worked, without triggering a flight to cash, especially when combined with other monetary policy measures.

The law and order camp is equally mistaken. By acting as a store of value and a means of payment, cash fulfils an important social function for law-abiding citizens, even if cash is sometimes used for illicit purposes. Would anyone suggest forbidding private ownership of luxury cars or gems because criminals like them?

And finally, the fintech alliance claims that its sophisticated digital payment solutions will make financial transactions easier. Customers would no longer need to carry wads of cash or search for ATMs. But it is an open question whether the still highly fragmented digital-payment sector will help customers more than the companies offering the payment solutions, he said.

There is one more major problem with the arguments for a cashless society: most people, at least in the Eurozone, don't want it. According to an as-yet-unpublished European Central Bank survey of 65,000 Eurozone residents, almost 80% of all point-of-sale transactions are conducted in cash; and, in terms of value, more than half of payments are made in cash.

As is often the case in Europe, there are great differences between member states: the share of cash transactions ranges from 42% in Finland to 92% in Malta. But, overall, the public's commitment to cash remains strong – and is becoming stronger.

In fact, growth in overall demand for cash is outpacing nominal GDP growth. In the last five years, the average annual growth rate of euro banknotes was 4.9% by value and 6.2% by piece. This rise includes denominations that are predominantly used for transactions, rather than for savings.

If Europe were to abolish cash, it would cut off people's only direct link to central-bank money. In a democracy, such a link helps to foster public acceptance of central-bank independence, by reinforcing the trust and support of the people in the conduct of effective monetary policymaking.

Mr Mersch finished his remarks by saying that the ECB will continue to provide banknotes. It will also facilitate the further development of an integrated, innovative, and competitive market for retail payment solutions in the Eurozone. If, one day, cash is replaced by electronic means of payments, that decision should reflect the will of the people, not the force of lobby groups.

RIISING DEMAND FOR BANKNOTES IN THE UK

The rise in the demand for banknotes, Mr Mersch talked about, is not limited to the Eurozone. In the UK, both the value and stock of banknotes in circulation, has grown steadily, economist Cordelia Kafetz wrote in a Bank of England staff blog post.

The value of pound notes in circulation grew 10 per cent in 2016, double its average rate over the past decade, as sterling's weakness fuelled demand for the highest denomination fifty-pound note and by the introduction of a new five pound note. Even

with the impact of those events stripped out, bills in circulation increased 8 per cent - the most in almost a decade - although, as a report by ING published this month showed, just one fifth of Britons generally carry cash.

UNOFFICIAL VOICES

It is expected that any comment by the ECB, although supportive of cash, has to be balanced and diplomatically correct. Less exalted organisation can be a little more direct. Farid Aliyev, Senior Financial Services Officer, at BEUC, the Bureau Européen des Unions de Consommateurs or European Consumer Organisation, pointed out in an article that the "get rid of cash" enthusiasts are deluding themselves. Globally, around 85% of consumer payments are still made in cash. In his article, Mr Aliyev makes the same point as Mr Mersch, namely that by their very payment actions, consumers demand choice and that includes being able to use cash.

Banks and card companies such as Visa or MasterCard, and other providers of electronic payment services are all interested in seeing banknotes and coins disappear and they point to the many studies that talk about the huge costs of printing cash and its circulation. Why are they so keen to abolish cash? The answer is that they don't earn money from these kinds of transactions, unlike from digital payments, Mr Aliyev said. And they are less eager to show that all the studies conclude that credit cards represent by far the most expensive payment method for the consumer and the merchant.

While comparison among payment instruments mostly focuses on the cost element (easily quantifiable), qualitative aspects (difficult to quantify) and the consumer perspective too often stay in the background. More recently, as part of the EU plan to fight against the financing of terrorism, debate focused around the relevance of setting a maximum limit on cash transactions. Without questioning the need to fight against terrorism and illegal activities, policy-makers should also keep the consumer angle in mind when debating the future of cash.

THE SYSTEM WORKS, SO WHY ABOLISH IT?

Cash has a number of advantages, which cannot be matched by any electronic payment method, at least for now. Those features are well known and explain in large part why cash is still widely used by consumers. They also underline why the idea of a cashless society should be buried.

Echoing the ECB's Mr Mersch, Mr Aliyev emphasized that the continued existence of cash is a

matter of consumers' freedom. Cash ensures consumers are not beholden to banks and other businesses. Getting rid of cash would be a power grab by financial providers. After a banking crisis, which wiped out consumer trust in the banks, withdrawing cash from circulation would not be a wise move.

Each payment instrument has its advantages and inconveniences. In a competitive market various payment instruments and solutions should co-exist and satisfy users' specific needs. Consumer choice is not something to be taken lightly. ■



The International Currency Association, ICA, has launched its campaign 'cash.matters'. 'One of the main objectives of the ICA is to give all those a voice who see cash as an integral and inclusive part of the payment landscape now and in the future,' said the ICA's newly elected Chairman, Barna Barabas. cash.matters will present facts and figures on cash as well as function as the platform which the ICA, and hopefully many other organisations, will use to run pro cash campaigns.'

Beside a website, cash.matters will make extensive use of social media to attract a broad public.

'The design is fresh and young, and cash.matters is set up to work perfectly on all platforms and devices. We do expect lively debates on all our channels. This is the first global pro cash initiative, and its reach extends far beyond the industry and experts but aims to include every global citizen and initiative who think that cash is here to stay', explained the Chairs of the ICA Global Cash Alliance Committee, Andrea Nitsche and Gerben van Wijk, who are responsible for cash.matters.

While cash.matters is set up as a movement with global reach, it also shares substantial information, statistics, white papers and facts and figures on the site for journalists, central banks and experts, explained the chairs. Nitsche and van Wijk are confident that over time they will gather many allies across the globe behind cash.matters and channel existing national voices and initiatives into one big global movement. ■



petition stated. "We demand that you cease to use animal products in the production of currency that we have to use."

One UK newspaper, The Guardian, quoted the reaction of the Australian academic, Prof. Solomon, who headed the team at the country's research and development body, CSIRO, which developed the polymer substrate, as saying: "It's stupid. It's absolutely stupid. There's trivial amounts of it in there." The Bank of England, however, took a far more conciliatory line.

Whatever the merits of this case, the new banknotes had been printed and a 'demonetisation', a la India was out of the question, the Bank said. It even announced that the coming new £10 polymer note would be printed on the same tallow-bearing polymer. Production of this note began last August and by mid February this year, ahead of the planned issuance in September, 275 million notes had already been printed, at a cost of £24 million. Previously, the Bank had also spent £46 million on printing the £5 polymer note.

However, to show that it takes public opinion seriously, the Bank of England, on 15 February announced a public consultation "to seek the views of the public on options for the future composition of polymer notes, namely the next £20 note and future reprints of the £5 and £10. This will allow the Bank to understand better the range of public opinion." The Bank also had extensive talks with potentially affected religious groups; groups representing vegans and vegetarians; and environmental organisations.

The full consultation began on 30 March and was introduced by a long statement about the nature of the polymer substrate, its manufacturing process, including the role of animal-derived additives and any alternative options which could be used in its future banknotes. Any possible alternatives to tallow, such as coconut oil or palm oil, have their own ethical or environmental concerns and the Bank commissioned an independent report on the environmental impact of a range of additives from a consultancy firm, Efeca. The Efeca Report was published alongside the consultation. The text of the consultation and the four questions to the public were available on the website of the Bank of England until the consultation closed on 12 May. The Bank plans to issue a summary of the responses to the consultation, its conclusion and its proposals for the future content of polymer substrate in the summer.

On its website, the Bank said that the development and launch of a new note can take four years or

By the time this article is printed, the UK £5 note, featuring Elizabeth Fry, will be just a piece of paper in some forgetful person's wallet and its only value will be sentimental. On 5 May 2017, the old paper note lost its status as legal tender and the new polymer £5 note featuring Sir Winston Churchill is now the only £5 note that can be used. On 5 April, the Bank of England said that over 50 per cent of all Fry fivers had already been returned to the BoE to be destroyed, but there were still around 160 million notes left in circulation. Although retailers and the public no longer have to accept the paper £5 note as payment or in change, the BoE will continue to exchange Fry £5 notes forever, as it would for any other Bank of England note which is no longer has legal tender.

The new polymer £5 note was issued on 13 September 2016 as the first of a new series of polymer banknotes that will continue with the issue of the new £10 note featuring the 18/19 century English novelist Jane Austen in September this year and a new £20 note which will show the painter J.M.W. Turner, which is due to be issued by 2020. The new £10 note will be unveiled on 16 July, the 200th anniversary of Jane Austen's death. The event will take place at Winchester Cathedral, where Austen was buried in 1817.

A TINY, GREASY EMBARRASSMENT

The new £5 note seemed initially well accepted by the public until it ran into rather unusual difficulties. At the end of November 2016, the Bank of England had to admit that the new polymer note contained traces of animal fat in the form of tallow, which is used in manufacturing the base polymer film marketed as Guardian by Innovia Security. The British press went into overdrive after more than 120,000 people supported an online petition urging the Bank of England to cease using animal fat in the production of five pound notes. "The new £5 notes contain animal fat in the form of tallow. This is unacceptable to millions of vegans, vegetarians, Hindus, Sikhs, Jains and others in the UK," the

Image: Bank of England

more. The tender for the £20 substrate has been put on hold to accommodate a decision on the future composition of the polymer used, but the Bank needs to take a decision soon in order to be able to launch the new £20 polymer note by 2020. Since December 2016, the Bank has been working with De La Rue and Innovia Security, the potential suppliers of polymer substrate, to assess alternative options, such as palm oil or coconut oil. Their conclusion is that the only practical alternative to animal-derived additives, are additives derived from palm oil, which offers a mature supply chain.

The Bank of England did well to take the concerns of a small minority of banknote users seriously. Perhaps it learned from history. The last time animal fat, such as tallow in unexpected places, caused an uproar for Britain, was when native troops in the army of the British East India Company were issued rifle cartridges greased with pig or beef fat. They had to tear the cartridges open with their teeth, upsetting both Moslem and Hindu soldiers and leading to the Indian mutiny of 1857, which almost cost the British a good part of their empire. ■

INDIA'S DEMONETISATION STILL MAKES WAVES

The effects of India's demonetisation of Rs. 500 and 1000 notes in November last year may have worn off slowly in India itself, in neighbouring countries, where Indian rupees are also used, or at least held in large numbers, the repercussions are still being felt.

The economies of India's northern neighbours Nepal and Bhutan both depend to a great extent on the Indian rupee, which makes up a significant percentage of both countries' foreign exchange stock. Indian rupees are also officially used in Bhutan, while in Nepal they are commonly used at the retail level.

There are large numbers of migrant workers from these countries, but especially from Nepal, who, in an average year, send around 70 billion Indian Rupees (\$640 million) in remittances and Reuters estimated that there may be 10 billion Indian rupees (\$146 million) held by individuals and the informal sector in Nepal. The Nepalese banking system itself held demonetised Indian banknotes worth about IRs 33.6 million.

When India made 500 and 1000 Rupee notes worthless in India, they became equally worthless in Nepal, but there were no facilities to exchange the notes for newly issued 500 and 2000 Indian Rupees in Nepal. The Nepal Rastra Bank, the country's central bank, even declared the new Indian banknotes "unauthorised and illegal", until India issued a formal FEMA notification as per the Foreign Exchange Management Act, which it soon did.

The Reserve Bank of India (RBI) itself had banned individuals carrying (old) IR 500 and 1000 notes to Nepal and Bhutan, fearing that these countries could become 'clearing houses' for the defunct notes. However, at the end of January, the RBI decided that individuals from India could carry the old IRs 1000 and/or 500 notes to Nepal, up to the limit of IRs 25,000. This came as a relief to migrant workers, who in the interim, when going back to their country, had to carry their money in bundles of IR 100 notes, making them very vulnerable to robbery. But it did not solve the problem that these notes were worthless in India - and officially in Nepal as well.

The issue of the demonetised notes in Nepal and Bhutan clearly had become urgent. At the end of March, a team of the Reserve Bank of India (RBI) held talks with Nepali officials on providing exchange facilities for Nepali nationals holding demonetised Indian banknotes. The Indian team offered exchange facilities for up to the limit of IRs 4,500 (€64) per person and gave one week's window to complete the exchange formalities.

However, the Nepali side had been pushing to arrange facilities up to Indian Rs 25,000. The NRB team has conveyed to the RBI team that it is also impossible to exchange banned Indian notes within a week as the Nepali side is yet to conduct inventory of banned Indian bills held by Nepalis. However, the RBI team said it was ready to exchange Indian notes held with Nepali banking and financial institutions immediately but currency notes held by individuals should be exchanged through the banking system. It seems that the fate of demonetised Indian 500 and 1000 Rupee banknotes held by Nepalis is still uncertain even though it has already been six months since the Indian government announced to withdraw legal tender of such banknotes.

Meanwhile in India all limits on ATM withdrawals have been ended and the banks can again set their own limits on cash withdrawals. But a new IR 1000 has still not hit the streets. At the end of February, the Financial Times said that India's economy grew 7 per cent in the last quarter 2016, down slightly from 7.4 per cent growth in the previous quarter, while Reuters had forecast growth of 6.4 per cent for the October-December period. Growth in the January to March quarter was said to be 6.1 per cent. Indian officials said that vindicated their claim that the ban on 86 per cent of the country's cash, would have only a temporary economic impact.

But many analysts believe the figures understate the true disruption of demonetisation, because the businesses hardest hit were informal enterprises, which historically operated mostly in cash and are tough to measure. ■



The European Central Bank recently introduced the new € 50 note into circulation, the fourth upgrade in the Euro series. To further reduce counterfeiting, it sought the advice of an neuroscientist in the design phase. Implementing his advice was difficult.

On April 4, 2017, the new €50 note entered into circulation. The European Central Bank announced that the new note will be more resistant to counterfeiting and that the security features had been upgraded. As the new €20 note, introduced in 2015, the new €50 includes a window near the top of the holograph stripe that reveals a portrait of the mythological 'Europa', beloved and desired by the god Zeus. The same portrait is also present as a multi-tone watermark alongside the denomination as an electrotone watermark.

The €50 is the most widely used Euro banknote. With over 9 billion of them in circulation, they account for 46 per cent of all euro banknotes. The €50 banknotes of the first series will remain legal tender and continue to circulate alongside the new notes and will be gradually withdrawn from circulation.

THE MORE THE BETTER?

The new note certainly has a lot of security features, such as a watermark, the OVI feature in the denomination number, intaglio printing, micro printing, etc. and yet, Euro banknotes are still being counterfeited and most counterfeits are only caught when the notes return to the central banks. The ECB's extensive and sophisticated campaigns to educate the public about the security features and how to spot counterfeits may do some good, but it is hard to quantify just how much good they do. The same applies to the number and the sophistication of the security features. The only thing the ECB probably finds easy to quantify is the cost of each security feature. How much each contributes to keeping the number of counterfeits relatively low is unknown.

Considering the fact that accepting a counterfeit note represents a loss of the value of that note to the bearer and passing it on knowingly is a crime, why don't we pay more attention when handling money? This problem of inattention led the ECB to explore a simple question: could banknotes be

better designed so that the person on the street would notice when something was amiss?

The ECB thought when designing the new Europa series, and especially the €50 note, that the answer may lay in the way we see things. According to an article in the Financial Times, the Bank contacted the well-known US neuroscientist David Eagleman at Stanford University, to find out which elements of banknotes were noticed, and which weren't, and to make recommendations for banknote design that would increase security - and coincidentally lower cost at the same time.

Eagleman describes a banknote as a bustling collection of security devices, which no one pays any attention to. People who pass notes around in daily transactions don't typically pause to examine them carefully. And here, the way we see things comes into play. Our visual sense is not like a camera that takes in the complete scene. Instead, we see only the details that our brains go out to seek. And with banknotes, we may glance at one to verify that it matches the general template we're expecting, but we don't scrutinise the details. That's why the ECB's campaign urging people to stop and pay attention to money didn't work: we don't attend to things that sufficiently fit our assumptions. We believe we already know the note in our hands, Eagleman explained.

The question therefore is, which details do we notice or not notice, and why? Which features could be better designed to be brain-compatible? Of all the anti-counterfeiting measures the Bank takes, which ones work, and how could their efforts be better spent? Eagleman and his colleagues tested the perceptions of random participants for over a year, noting that the public seems to be shockingly bad at spotting differences.

At his final presentation to the ECB, he put forward evidence that the watermark on an Euro should be



The face of Europa:
The portrait watermark and the portrait window in the new € 50 note. (All images European Central Bank)

a face instead of a building. This is because the human brain is much more specialized in recognizing faces than buildings, and people instinctively recognize if a face 'looks wrong'. The Bank accepted the finding but faced an obvious difficulty in implementing it. A face in a watermark, a hologram or a central portrait, works best if it is generally very well known and instantly recognized. But which public figure, equally well known and ideally well liked and accepted in all the 19 EU countries that are members of the Euro zone, from Spain to Estonia, could the ECB have chosen? There probably is none that would fit.

The Bank in the end chose the classic, mythological figure of Europa as the face in the watermark and the hologram of the Europa series. A face is more memorable than a doorway, but 'Europa' is far from ideal, as we only recognize a face as being 'wrong', by referring back in our memory to face-to-face meetings, a photograph or a painting. This shows the advantage of being able to put the portrait of a monarch or a recent head of state on the face of a banknote, an advantage the ECB obviously had to forego. When Indians look at the new 2000 Rupee note, they see Mahatma Gandhi in the portrait and the watermark and they know what he should look like, although there are few people alive that have seen the real man.

OTHER RADICAL SUGGESTIONS

Eagleman also recommended that the Euro should follow the US Dollar in making all denominations the

same size. This would force people to look at the notes a little longer before spending or accepting them. The ECB declined this advice, as it would involve the re-tooling of all European vending machines and ATMs. Although the bank agreed in theory with the finding, Eagleman's final suggestion was also not accepted. He had observed that banknotes are jam-packed with decorative features that have nothing to do with security. No one notices the security features because of all the distractions. A banknote, he suggested, should be a blank white piece of paper with a single hologram in the middle. That's it. A counterfeiter would not be able to replicate that on a printer, and the man in the street wouldn't be side-tracked by all the detailing that has nothing to do with the security. And thus the experiment came to a close, Eagleman wrote. Effective solutions sometimes bump up against tradition.

NOT ONLY SECURITY

If we look at banknotes exclusively from a viewpoint of counterfeit resistance, the recommendations of the neuroscientist were without doubt correct. But a banknote is more than just a proof of value that has to be secured at any price. Banknotes are intensely political and cultural and none more so than the Euro. Banknotes reflect the history and the culture of a country and while there is definitely a great, common European culture, any historic personalities that would express this culture are mostly intensely national and therefore too 'partisan' for a transnational currency. ■

IBNS BANKNOTE OF THE YEAR

In stark contrast to the findings of neuroscientist David Eagleman, this year's 'Banknote of the Year' is the Sfr 50 note, which is stuffed full of symbolism, hidden security features and interestingly distracting pictures.

The International Bank Note Society (IBNS) has awarded its prestigious "Bank Note of the Year Award" for 2016 to the Swiss National Bank. With almost 120 new banknotes released worldwide during 2016, over half were of sufficiently new design to be eligible for nomination. While the Swiss 50 Franc hybrid note was the narrow winner, runners-up in very tight voting were the Maldives Islands 1000 Rufiyaa tortoise/whale shark, Argentina's 500 Peso jaguar, and the Royal Bank of Scotland's 5 Pound first polymer note.

The Swiss 50 Franc note is the first new design of

the Swiss National Bank in 20 years. Printed by Orell Füssli Security Printing Ltd., this note features wind and national experiences. Incorporating the latest security features, future notes will depict time, light, water, matter and language. Using the three layer substrate Durasafe, the bright green vertical banknote depicts dandelion seeds, a paraglider aloft in the mountains and a human hand. Slightly smaller than US banknotes, this is the first hybrid note to win the coveted IBNS banknote award.

The IBNS is now accepting nominations for next year's award and the first one shown on its website was the new Norwegian 100 Kroner note. Although the last - and still current - series of Kroner notes all had prominent central portraits, repeated in the watermark, the new series shows realistic renderings of fish, lighthouses, and boats on the front and minimalist pixelations, vaguely associated with the sea, on the back. The watermark will be a puffin. ■

(A part of) the new Sfr 50 banknote, winner of the IBNS 'Banknote of the Year 2016' Award





The future form of money

Jon Nicolaisen at the Norwegian Academy of Science and Letters.
Photo: Nils S. Aasheim/Norges Bank

The deputy governor of the Norwegian Central Bank provided a possible scenario of the disappearance of cash and good arguments for retaining it.

In late April 2017, Jon Nicolaisen, the deputy governor of Norges Bank, Norway's Central Bank, gave a wide-ranging speech at the Norwegian Academy of Science and Letters. His subject was, of course, money. What it is, how it is made and what it may become in future. After an historical discourse about the first banknotes printed in Europe - in Norway's neighbour Sweden, and the first central bank, also in Sweden - he offered the standard definition of money as a means of payment, a universally recognised common unit of account and a store of value.

HOW BANKS MAKE MONEY

A banknote, he said, is in reality a promissory note - an interest-free claim on the issuer. Its value depends on trust that the issuer will keep his word and that the banknote proves to have the promised value. But in a country such as Norway, only a very small percentage of "money" is in the form of banknotes or coins, as there are two forms of central bank money, the physical kind - coins and banknotes - and bank reserves, amounting to a sum total of about NOK 85 billion. But the total money supply is much larger than this. Customer deposits in banks are also money and they are a claim on the bank, not the central bank. These deposits, called deposit money, total more than NOK 2 trillion in Norway. This money is created by private banks, not by Norges Bank. Today, banknotes and coins make up less than 2.5 per cent of the money supply. In other words, virtually all the money used in Norway has been created by banks - out of nothing. It is fiat money: fiat - let it become.

Fiat money is made in the form of bank loans. Once in the borrower's bank account, the money usually starts to circulate and it is only removed from circulation, if someone is repaying a bank loan. The money supply is therefore only reduced when banks' claims on the rest of the economy decrease. Banks also fund lending by raising loans themselves and also use other forms of investment in addition to lending in order to reduce risk.

Is this privately issued deposit money, most of which will never be converted into 'real' banknotes or coins, an illusion? And why is it thought to be as safe as money issued by the central bank? Mr Nicolaisen asked.

NEW FORMS OF PAYMENT AND OF MONEY

Trust is necessary, though not sufficient, for money to function as a universal means of payment. It must also be efficient and safe to use. In paying by bank card, a huge system is set in motion. Payments move back and forth between banks and are settled by transferring money between their accounts at Norges Bank. The hub of the payment system in Norway is Norges Bank's settlement system, and it is the central bank's responsibility to make sure the system is efficient and reliable, as society is completely dependent on the smooth functioning of the settlement system.

Now, new methods of payment have appeared, for example through mobile phone apps and companies such as Apple and Google have entered the payment market. Although convenient, this comes at a price, namely challenges to data privacy and the security of the payment system. As the apps are only a customer interface linked to international card schemes such as Visa and Mastercard, users may not cover costs directly, but the costs of these schemes are high, making them an expensive alternative for banks. Eventually, banks' customers foot the bill one way or another.

Cheaper alternatives are on their way, and could also result in faster payments. National payment card schemes, such as BankAxept in Norway, might provide an alternative to the international card schemes, including access to new services. New regulations have been introduced to lower the costs related to international cards. A new EU regulation also provides for direct bank-to-bank payments, bypassing the card schemes entirely.

There are not only new forms of payment but of new money as well - so called e-money. This is electronic money issued by non-bank entities, but in existing currencies. Paypal customers can make payments through their Paypal account. Facebook has recently applied for a Europe-wide e-money licence. If large providers offer an attractive, user-friendly solution, this payment method could become widespread, but success depends on consumer trust. E-money is a claim on the issuing company and it is not backed by a deposit insurance scheme or any authority.

CYBERCRIME

Counterfeiting of banknotes is still seen as a major crime, but even the most audacious schemes

will not threaten a country's financial system. Not so with rapidly evolving cybercrime, which even attacks central banks, as in the case of the Central Bank of Bangladesh in February last year. All the institutions involved in the payment system are working hard to prevent cyberattacks, but we can never be completely certain that the system will be able to resist all possible attacks. Ultimately, there may come a time when our systems have to be shut down for a period, Mr Nicolaisen warned. He said that we need to be prepared for such a situation. Contingency arrangements, primarily reserve solutions in our electronic systems, must provide protection against a wide range of incidents, not just cyberattacks. The ultimate contingency and reserve solution is banknotes and coins. On the advice of Norges Bank and Finanstilsynet (Financial Supervisory Authority of Norway), the Ministry of Finance recently circulated a consultation paper proposing a regulation to ensure the availability of cash in a contingency.

THE FUTURE FORM OF MONEY?

As the role of banknotes and coins continues to diminish, with payments increasingly made with deposit money in bank accounts and new forms of payment are entering, the question is: what should the future form of money be?

Some people believe that deposit money will ultimately become the sole means of payment, as Norwegians trust deposit money. As long as they do, using deposit money will be cheap and efficient for the consumer. But is it entirely unproblematic?

As an example, Mr. Nicolaisen gave the case of a hypothetical customer who hadn't used cash for a very long time and made only digital payments. Then major cyberattacks against the his bank happened, shutting down the system for hours. Feeling unsure, the customer wanted his money. He logs on to his online bank, to get it. His options are to transfer his money to an account in another bank or to a pre-paid card. But he does not trust either option. He decides he wants cash and contacts his bank, which is currently unable to provide Norwegian banknotes. His options now are to use an account in another bank or a pre-paid card, the same as before. But the bank can offer Euros which he accepts. This leads to another problem. In order to use Euros in Norway, the shop has to accept payment in Euros. If not, he will have to deposit the Euros in his bank account in order to make the payment – bringing him back to square one.

WHAT HAS BEEN LOST HERE?

First, the fictional customer has become completely dependent on a third party – the bank: payments can no longer be made directly between two

parties, but only through a bank, a card company or an app. Today, one can still settle a payment at a shop in cash, without involving anyone else.

Second, he has become dependent on the technology functioning as it should. As long as cash is available, technology is not needed to settle payments.

Third, he is no longer anonymous when he makes a payment. All payment transactions using deposit money are recorded. Anonymous payments are often associated with something negative, such as tax evasion or other criminal activity. But there is another side to anonymity – privacy.

Fourth, he no longer has access to money directly backed by the country's authorities. There is no longer functional legal tender. The monetary system has been turned over to private entities.

We have to ask ourselves: should we allow private solutions to compete freely in developing means of payment, or must the authorities play a role? The means of payment itself – our money – must be universal, because money is only useful if it is widely used. This requires trust. Deposit guarantees, which cover deposits of up to NOK 2 million per depositor per bank, as well as banking regulations promote trust. The objective of monetary policy is to maintain stability in the value of the currency. Privacy rules prevent unauthorised access to payment information.

There are some characteristics, deposit money lacks. It cannot offer anonymous payments. The system is vulnerable to advanced attacks. Having more money on deposit than is covered by the deposit guarantee scheme involves risk. Nor is direct and immediate settlement between two parties, without the involvement of a third party, possible without cash.

In the future, new payment solutions may be able to offer these possibilities. Private digital currencies providing anonymity are already on the market. However, they are not backed by any authority and the level of foreign exchange and credit risk can be high. One alternative currently being discussed is the introduction of electronic central bank money. There are several ways of achieving this: consumers can have an account either at the central bank itself or in a system controlled by the central bank. Another possible solution is for Norges Bank to issue a payment card or develop an app for consumers to use for anonymous payments.

There is another, related question: which means of payment should be the statutory form of legal

tender in Norway if we introduce electronic central bank money? Should it be banknotes and coins, or Norges Bank's electronic money, or both?

What would the consequences of this be for the banking system? For many consumers, electronic central bank money could provide an alternative to deposit money in a bank, as cash does today. Banks can attract deposits through the interest rates they offer. But their ability to create money and extend credit could nonetheless be affected, especially if this new form of electronic money enters into widespread use.

Norges Bank has begun to assess what the future form of money should be. Whatever the conclusion, we can be fairly certain that banknotes and coins will be with us for many years yet. Deposit money

in banks will most likely continue to be the dominant means of payment, even if electronic central bank money is introduced. Nevertheless, the very fact that these questions are being raised, heralds a new era for our monetary system.

Choosing the direction the future monetary system and payment system will take, requires not only economists, but also technologists, lawyers and other social scientists. And political decisions will ultimately need to be made by the government and by parliament. The questions are numerous, but we already have one of the answers. Central banks were established to build confidence in the monetary system. That is still their primary task. We cannot leave the monetary system entirely in the hands of private entities. There will be a role for central bank money. ■

GIESECKE + DEVRIENT - A GOOD YEAR AND FOUR NEW BEGINNINGS

Giesecke +Devrient; a global security technology group, had an excellent fiscal year 2016. Posting the highest revenue in the company's history at approximately EUR 2.1 billion and increasing earnings before interest and taxes (EBIT) by around 23 per cent to EUR 125 million. Despite increased tax expense following the company's reorganization, G+D achieved a strongly positive net income of EUR 52.5 million in the fiscal year ending December 31, 2016, roughly equivalent to the result for the previous year. All four business units – Banknote, Mobile Security, Veridos, and secunet – made a positive contribution to Group earnings before interest and taxes.

NEW COMPANY STRUCTURE

During the last fiscal year, G+D laid the foundations for a new Group structure, which has been in place internally since the beginning of 2017 and will become legally effective in the third quarter of 2017. The G+D Group is being divided into four subgroups, which will be legally independent companies with greater entrepreneurial freedom and responsibility than in the past.

The Banknote and Mobile Security business units have been renamed as part of the new G+D structure. Banknote has become Giesecke+Devrient Currency Technology GmbH, while Mobile Security now operates as Giesecke+Devrient Mobile Security GmbH. The other subgroups are Veridos GmbH – in which G+D holds a majority stake of 60 per cent – and listed company secunet AG, where G+D is the majority shareholder with a stake of around 79 per cent.

BUSINESS UNITS

At around EUR 928 million, the Banknote business unit again made the largest contribution to Group revenue. Revenue increases were achieved in banknote security solutions, plant engineering, and automated cash cycle systems in particular.

The Mobile Security business unit achieved a revenue of around EUR 863 million. The business environment is currently characterized by fierce price competition. Revenue increased in India, China and Indonesia during the 2016 fiscal year.

Veridos GmbH, a joint venture between G+D and Bundesdruckerei, achieved growth of around 33 per cent in 2016. This was largely due to a substantial increase in its ID card business. Veridos contributed around EUR 183 million to G+D's total revenue.

Listed company secunet AG was able to boost its revenue by 28 per cent to around EUR 115 million in 2016. The sales growth and record earnings posted by the company were driven by increasing demand for high-quality, trusted IT security products and services.

DEDICATED DIGITIZATION UNIT

In May 2017, G+D launched a unit intended to act as a catalyst for new digital technologies and business models within the company. As a legally independent subsidiary, "G+D advance52" will help the subgroups to expand their digital business in the core areas of payment, identity, and connectivity. The aim is to develop new digital products to market readiness via an accelerated process. ■

The winning entry of the Dezeen passport competition, announced in April 2017 (right)

Last year, the UK Passport Office unveiled the design for the next UK passport. That was before the referendum. Now that the UK is set to leave the European Union, the country will need a new passport that may look very different from the present one.



Burgundy turns to blue

Although the UK passport is valid for ten years, in November 2015, the UK presented a new design to follow the “beautiful Britain” design of five years ago. This is normal practice of the UK Passport Office to deter counterfeiters, although it means that at any time there are valid UK passports with two very different designs in circulation.

One year later, the referendum about the future of Britain within or without Europe happened, upending - well, almost everything, including the well-laid plans of the UK passport office. Article 50, the notification to leave the European Union, was invoked by the UK Prime Minister in April 2017, which will lead to the final separation two years later. It is therefore obvious that the majority of UK passports, if not all, will state something that will be no longer true. This is the statement on the burgundy coloured cover denoting “EUROPEAN UNION” followed by “UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND”. It is a temporary problem that will disappear after five to ten years, unless the UK government decides to cancel all UK passports with the EU line and issue new ones, regardless of remaining validity. But that would cause logistic problems and lead to complaints that people would have to pay for a new passport when the old one still had years to go.

The current contract expires in 2019, the year the UK is set to leave the EU. Just days before triggering Article 50, the Government’s Home Office



put out a tender for a new British passport design and production worth £490 million and to launch in 2019. The new project has a run-time of 11.5 years, with potential of renewal within this time.

There is not yet a specific date confirmed for the new passport’s roll-out. A Home Office spokesperson says: “The timing of any potential changes to the passport after the UK has left the European Union has not been set.”

In 2009 De La Rue was awarded a £400 million ten-year contract to print the UK passport and there is no doubt that the company will again respond to the tender for the new contract. The design process for the new passport, however, if it is to coincide with the UK’s new EU free status, will have to start well before that.

What the new non-EU passport will look like is not known at the time of writing, but immediately after the referendum, as true-blue Brexiteers were calling for a return to the old dark blue cover, the home secretary gave a written answer in Parliament stating that “there are no immediate plans for changes to the format or colour of the UK passport. Parliament will be informed of any changes to the passport following UK withdrawal from the European Union.”

That would have come as a particular disappointment to Nigel Farage, the chief leave proponent,

who disapprovingly brandished his EU passport on a more or less hourly basis during the referendum campaign, as the Guardian wrote at the end of July last year.

The burgundy passport was one of the more persistent if minor refrains from the pro-leave camp in the run-up to the EU referendum. There is, of course, a good chance that UK traditionalists will get their blue cover back, but meanwhile designers, not only in Britain, but in the whole of Europa, unchained their creativity to imagine what a post Brexit passports could look like.

IMAGING A NATIONAL SYMBOL ANEW

In mid-February, the design magazine DEZEEN started an unofficial Brexit passport design competition, totally free from any of the technical and security considerations, real passport designers have to face. The magazine was well aware that the winning designs were unlikely to be adopted by the government, but they were presented to the Home Office nevertheless and with the invitation to respond. There were over 200 entries from 34 different countries. The youngest entrant was 12 years old and the oldest was 83. Most submissions were from architects and designers but there were also entries from non-designers, students, retired people and unemployed people.

The designs, many of them light-hearted, often looked at what it means to belong to a country, and to be a traveller. One entry presented the cover as a luggage-tag with transparent visa pages displaying an X-ray of things a traveller may pack. As the passport travels around the world, visa stamps are added to these items that represent gifts given in return by each country. Another design featured the name of every country in the world, with the United Kingdom picked out in red. The countries are listed in order of their immigrant population on the front and their emigrant population on the back, with the lists spilling onto the visa pages inside. The design aims to acknowledge the “continuous comings and goings of people and ideas that form civilisation”.

One design even suggested the UK passport as a social tool, to mend international bonds broken by Brexit. It has an iridescent cover and it is worn around the neck, where it acts as a conversation starter. On the visa

pages are handy translations of foreign phrases. The winning entry came from Scotland and had the description “Britain needs a visual metaphor to reflect the pre- and post-referendum spirit”. The cover starts out at the bottom as the current burgundy EU passport and gradually turns dark blue, representing the old, pre-European Union passport. The visa pages meanwhile are completely blank. The designer described his passport design as an “honest reflection of the pre- and post-referendum spirit of the country and all those involved”.

The designs are obviously far from what the UK Passport Office needs for its next project, but they offer a fresh look at some fundamental questions, such as what it means to be British - one design even avoided any pictorial or linguistic allusion to Britain, claiming that the country is now multinational and multicultural - to Britain's place in the world and to individual identity. And thinking about that cannot be a bad thing, even for Her Majesty's Passport Office. ■

NEWS

Oberthur Technologies (OT) and Safran Identity & Security (Morpho)

have announced they are joining forces. In September 2016, Safran announced that it had entered into exclusive negotiations with Advent International, the owner of Oberthur Technologies since 2011, to sell its identity and security activities and the transaction was finalised on 31 May 2017. Temporarily designated by the name OT-Morpho, the company will unveil its new name in September 2017.

With close to 3 billion euros in revenues, OT-Morpho employs more than 14,000 people worldwide, nearly 2,000 of whom work in R&D.

Optaglio launches holographic portrait solution.

The company has developed a technology for issuing personalised ID cards with a holographic portrait of a holder. The firm's solution involves the creation of a basic hologram, which cannot be imitated, with a blank section. This blank section can be filled with a 3D portrait using a special writer delivered by the company.

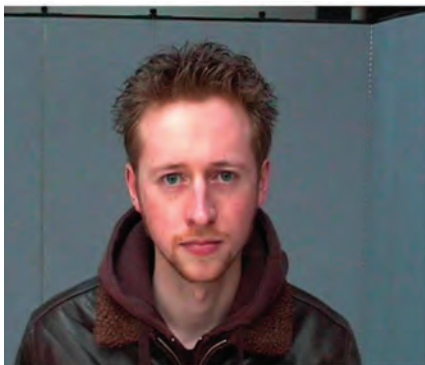
The company says the new technology overcomes a long-term issue connected to the holographic protection of ID cards and passports.

To raise comments in passport lines: a passport to wear around your neck, the second prize in the Dezeen UK Passport Competition



HOW EASY IS IT TO SPOT A MORPH?

Superb security features in passports are pushing fraudsters towards genuine documents obtained under false pretenses. Morphing ID photos has emerged as a new technique for this purpose. How difficult is it to spot these images? A team of researchers in the UK has found out.



Press 1 for Match (Experiment 1 & 2)
Press 2 for Mismatch (Experiment 1 & 2)
Press 3 for Morph (Experiment 2)

One of the test pieces. Left the original photo and right the morphed image.

As ID documents are getting more and more sophisticated, people smugglers are turning increasingly to genuine documents obtained fraudulently. One of the new forms of doing this is to have a rightful owner of a passport apply for a replacement and in doing so supply passport photographs that could be used for two different people.

The technique to change a photograph to closely resemble two people is called morphing, and the necessary technology to this end is relatively freely available. To test how easy it is to fool border officers and even face recognition technology, three researchers from the University of York in the UK, conducted a series of three experiments and published the results in a research article in the scientific Open Access journal, PLOS ONE, with the title *Fraudulent ID using face morphs: Experiments on human and automatic recognition*.

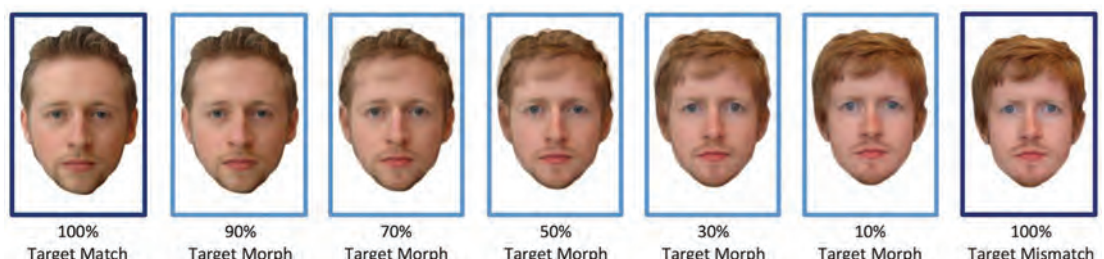
The researchers, David J. Robertson, Robin S. S. Kramer, A. Mike Burton wrote that checking two different images of an unfamiliar person is known

to be very difficult and prone to error. Furthermore, comparing a real person to a photo is just as difficult as comparing two photos, especially if there are several years between the time the photos were taken, as happens usually in passport renewals. This difficulty is not confined to novice viewers, as other research showed, that a group of working passport officers were no better at face matching than a group of untrained students.

The idea of morphing is to produce a photo for a document that may look sufficiently like two people to serve as ID for both. In one form of attack, a complicit passport owner submits a renewal application with the photo of a second person. The aim is to find pairs of people (legitimate owner and second person) who look sufficiently alike that a discrepancy will not be noticed i.e. to exploit the difficulty of this task for a viewer. A more sophisticated version of this attack is to present a photo which is a morph between the legitimate owner and the second person, with the aim that the resulting image looks sufficiently like both parties to become acceptable photo-ID for either.

THE EXPERIMENTS

The researchers conducted two experiments with human viewers and a third with a smartphone face recognition system. In the first experiment, viewers were asked to match pairs of photos of faces, without being warned that one of the pair could be a morph. To replicate a realistic scenario at a passport office, the participants were not asked whether a photo resembled person A or B, as this is not the problem facing a passport checker, who has to decide whether a single person is or is not legitimate. Instead, across a set of trials, viewers were asked to decide whether a photo-ID (passport) matched a second face image or not. In fact, sometimes the faces matched, sometimes they did not, and sometimes the ID photo was a morph between a matching and non-matching face. The researchers were particularly interested to observe acceptance rates at the 50/50 level (presumably the most useful in real fraud). They were also interested to observe whether acceptance rates declined smoothly (as the match image contained less and less of the target) or showed a point of steep decline.



While 50/50 target morphs were accepted as genuine matches less frequently than genuine photos, they were nevertheless accepted at a surprisingly high level. An acceptance rate of 68 per cent suggests that this type of image, when used as fraudulent ID, might sometimes provide acceptable documentation for two different people.

BETTER TO BE FOREWARNED

In the second experiment, participants were shown the same images as in the first one, but they were told about the possibility of 'fraudulent' ID using graphics morphing, and during the test were given an extra response option. When trying to match the face photos, they now had the options to respond 'match', 'mismatch' or 'morph'.

Results of the second experiment showed that again error rates for endpoints (100 per cent match and 100 per cent mismatch) were low, and consistent with the average population. There were no significant differences between 100 and 50 per cent morph levels, but there were significant rises in 'Mismatch' responses for each of the steps between 50, 30, 10 and 0 per cent.

Morph detection is therefore a clear function of morph level, with maximum detection at 50/50

morph. This is a very marked improvement over Experiment 1. When not briefed about the possibility of 'morph-fraud', participants in the first experiment accepted 50/50 morphs as genuine ID at a rate of 68 per cent. However, participants told to expect some morph images were accepting 50/50 morphs as genuine at only 21 per cent.

There were remarkable individual differences. People who were good at spotting morphs were also good at spotting that two unmanipulated pictures showed different faces. But there was huge range in the rate at which individual participants spotted morphs, ranging from 14 to 100 per cent.

AUTOMATED FACE RECOGNITION

In a third experiment, the researchers asked whether an automated face-recognition device is vulnerable to morphed ID. The results showed that the face recognition system tested - an iPhone was used - was relatively safe from morphed identity attacks. The system did accept 50 per cent morphs at a rate of 27 per cent and while this is perhaps not ideal, the acceptance rate falls well below a level at which two faces would be indistinguishable. In general, the decision 'strategy' of the device is conservative, making only denial of entry errors, and never allowing an 'imposter' access to the system. ■

WAITING FOR THE DELUGE

US citizens do not need passports to get out of their country, but to get back in. The US Passport Office expects to have its hands full in the next 18 months.

In late March, the US Federal News Radio said that the State Department was readying itself for the deluge of passport applications it expects over the next 18 months. The agency projects Americans will apply for 21 million passports in 2017 and 20.4 million in 2018 — up from 14.5 million in 2015 and 16.8 million in 2016. The reason for this expected onslaught is that back in 2007, the US government implemented the Western Travel Hemisphere Initiative (WHTI), which required US citizens to have passports to return from Canada, Mexico, the Bahamas and the Caribbean, instead of just using their driver's licenses, as was the case for decades. Those passports issued at that time have a validity of 10 years and many will be up for renewal. At the time, the passport agency, as part of the State Department, was unprepared for the 18.6 million applications - 50 per cent more than the year before - and ended up with a huge backlog, forcing citizens to wait anywhere from 12 weeks to 20 weeks. Now the agency wants to do better.

To comply with the WHTI, US citizens do not necessarily need a full passport book. For entry into the US from land border crossings or sea-ports from

Canada, Mexico, Bermuda and the Caribbean, a credit card sized passport card is sufficient. This card is cheaper than a full passport, but it does not allow for international air travel.

Although the expected 21 million passports in 2017 is a respectable number, it has to be set against the population of the USA - over 324 million in 2016. In 2015 there were 125,907,176 valid US passports in circulation, which means that about 39 per cent of Americans carried a passport. In the UK it is said to be around 95 per cent. Exact figures for the Schengen area are difficult to find and will be lower than for the UK, as for travel within Schengen, a valid ID card is sufficient. The last available figure for Germany talks of 28.2 Million in 2007, when the total population was 82.27 Million = around 34 per cent. Most of the popular holiday countries around the Mediterranean are part of the Schengen area.

In the course of 2017, the US State Department will issue a new biometric passport. The international press has already provided some details: It will have an embedded data chip with all personal data. The passport number will also be laser cut as tapered, perforated holes through pages. The "Next Generation" passport, will also have new artwork and security features such as a watermark, "tactile features," and more "optically variable" inks. ■

CALLS FOR BIOMETRIC ENTRY/EXIT CONTROL AT US BORDERS

In order to control increasing visa overstays, the US Department of Homeland Security is finally considering a biometric entry/exit system.

The US Department of Homeland Security (DHS) said that more than three quarters of a million travellers over-stayed their visas in the last fiscal year, an increase that will likely intensify calls for a long-awaited biometric exit programme that could keep better track of visitors to the country.

Writing in the 'Fiscal Year 2016 Entry/Exit Overstay Report', the DHS revealed that of the more than 50 million nonimmigrant admissions at US air and sea ports processed in the year, 739,478 overstayed their admission, resulting in a total overstay rate of 1.47 percent. Out of these overstays, 628,799 were suspected "in-country" overstays, those that have no recorded departure, while out-of-country overstays departed after their lawful admission period expired.

The highest rates of overstays were from countries outside the visa-waiver program. For example,

13 percent of the visitors from Afghanistan overstayed their visas, while nearly 11 percent of those from Iraq overstayed. The highest rates of overstays were from African countries. A quarter of all visitors from Burkina Faso and Djibouti overstayed their tourist or business visa.

The release of the higher 2016 figure comes amid growing momentum towards the implementation of a biometric entry and exit system, which was initially sought in 2004 by the independent, bi-partisan 9/11 Commission. In May, John Wagner, deputy assistant commissioner at Customs and Border Protection, laid out a vision for a facial recognition based biometric exit system. Wagner said facial recognition could also be used to identify travelers arriving in the US, including passport-holding citizens.

Many politicians paint biometric entry and exit control as a more realistic option to secure US borders than other options and some said that biometric identification technology would be more cost-effective than President Trump's planned border wall. ■

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EUROPOL FIGHTS MIGRANT SMUGGLING AND DOCUMENT FRAUD

Armed conflicts, economic and population pressures in Africa and the Middle East will continue to act as the main push factors for irregular migrants travelling to the EU. Migrant smuggling to and within the EU will remain a key criminal threat. (EU Serious and Organised Crime Threat Assessment 2017- SOCTA)

On May 17, *Europol*, the European police agency, announced that it had been instrumental in dismantling a criminal network that is accused of facilitating the illegal entry of migrants - mainly Syrians, Afghans and Iraqis - to and within Europe and the Schengen area, through the production and supply of false documents. It is estimated that the irregular migrants paid € 2 000 to € 3 000 for each false document. Investigations revealed that the gang had been criminally operating for 10 years. In the operation, the Spanish National Police were supported by Europol and Eurojust, and cooperated with the Hellenic Police and the Belgian Federal Police.

Eight members of the criminal organisation were arrested, seven in Spain - including the leader of the gang - and one in Greece, as a result of a coordinated law enforcement action day carried out simultaneously in Spain, Greece and Belgium on 28 March 2017. In total, eight houses were searched - five in Madrid (Spain), two in Athens (Greece) and one in Brussels (Belgium). This resulted in the seizure of EUR 100 000 in cash, numerous documents, money transfer receipts, data storage devices and mobile phones.

This is a report on one of the many actions that Europol leads against organized crime in Europe. And as the photograph shows, money, and far too often cash, is the lubricant that keeps the criminal networks going.

In its EU Serious and Organised Crime Threat Assessment 2017 (SOCTA), Europol identified document fraud as a key criminal activity linked to the migration crisis. It states that increasingly sophisticated security features protecting documents against forgery as well as improved technical control measures have compelled organized crime groups to improve the quality of fraudulent documents. Suppliers of raw materials now primarily rely on Darknet marketplaces to sell their products.

Fraudulent documents are multi-purpose criminal tools and each document can be used repeatedly to support different criminal activities. Document forgers are service providers often cooperating with

many different organized criminal gangs involved in various criminal activities.

The sale or rental of travel and identity documents such as passports is an increasing concern. There has been a significant increase in the number of lost and stolen documents in circulation.

Instability and armed conflicts often allow criminal groups to obtain blank documents from the affected regions. This is also true for conflict zones on the periphery of the EU and has been highlighted by the widespread availability of thousands of non-EU blank identity documents.

It is true that cash plays an important part in these criminal activities, but it is not doing that alone. SOCTA states that new payment methods such as crypto-currencies, prepaid cards, online payments and internet vouchers are continuously emerging and are generally less well-regulated than traditional payment methods. In combination with alternative banking platforms, these new payment methods allow the movement of large amounts of criminal funds.

Underground banking systems are financial networks operating outside of normal banking channels to transfer money internationally, avoiding the fees and regulations of conventional banks.

The abuse of genuine passports by look-alikes continues to be the main modus operandi used by document fraudsters. ID cards are the most commonly detected documents used as part of document fraud. ■



(Photo: Europol)

Perfect Banknotes With Minimum Invest in Quality Control

Quality control of freshly printed banknotes is cost-intensive. Printing plants are increasingly choosing single note inspection as a managed service, achieving guaranteed performance – no additional investment required. Only perfect banknotes enter the cash cycle.

option of initially using the outsourcing model on a test basis – it is possible to then take on the 'rented' systems later, at any time." In addition, trained employees are available as needed, in order to minimize the personnel costs for banknote printers.

Managed services are either implemented on the customer's premises, or at the global sites of G+D Currency Technology. There are four key advantages offered by the outsourcing model:

FULL COST CONTROL: The monthly fee ensures that costs are always transparent and manageable. No investment is required.

GUARANTEED PERFORMANCE: The single note inspection systems are available in full from the outset. Performance, scope and quality are clearly defined in Service Level Agreements.

EXPERIENCED STAFF: On request, G+D Currency Technology shall supply the customer with trained staff to operate the system on site. This means no additional staff costs.

A WIDER RANGE: This managed service enables printing plants to expand their service portfolio and accept print jobs that require 100% single note inspection.

"Two thirds of all banknote printers worldwide rely on our experience in single note inspection," explains service expert Hofer. G+D Currency Technology now has around 150 high-tech systems in use globally, from the BPS 2000 OBIS and BPS X9 series, checking freshly printed, numbered and cut banknotes, so that only perfect banknotes enter circulation. ■

Managed Services means



No advance investment



Costs according to expenditure



Full performance from the outset



External staff as required



High-end inspection systems



Detailed quality reports

Anyone looking to achieve 100% quality needs to individually check each single banknote. This process requires up to 200 features per banknote to be checked in fractions of a second. G+D Currency Technology has developed the BPS X9 for this technically demanding process; this system sets technical standards in printing plants and offers very high levels of productivity.

"Printing plants increasingly prefer the outsourcing model to reduce investment whilst increasing flexibility," claims Reinhard Hofer, Global Program Manager for Managed Services at G+D Currency Technology.

»Two thirds of all banknote printers rely on us for single note inspection.«

The system is used for single note inspection, and rather than buying the system outright, the company pays a monthly fee to use it. "Our customers also have the

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