

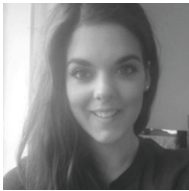
B

ringing In the Underbanked

Ethics & Trust in Finance
Global edition 2016-2017

Finalist

Tara Annison
Spain
*Digital Analyst,
HSBC Banl Plc*,
London*



* The views expressed herein are those of the author and do not necessarily reflect those of the Organization she is

Current banking provisions leave an estimated 2.5 billion (Chaia, Golland, Schiff, 2010) adults worldwide without access to a formal bank account. This means they are deprived of the opportunity to save and to borrow money at the best, regulated rates. Whilst 2.2 billion of these underserved adults reside in developing markets such as Africa, Asia and Latin America (Chaia et al, 2010), there are also 106 million adults in North America (Ashoka, 2013) and 1.5 million in Britain (FIC, 2016) without the necessary banking provisions.

These individuals may be from low income families, with no credit history. They may have no fixed abode, choosing to live in unconventional accommodation such a boats or caravans, or may be refugees, or internally displaced people who

cannot provide formal identification. Furthermore, segments of the populace who are unable to leverage technological developments such as online and mobile banking may also find themselves isolated from these rapidly growing credit channels.

It is these individuals who are defined as 'the underbanked'.

Their inability to access traditional financial provisions can, in part, be due to difficulty in providing the official identity verification documentation that is necessary to open a bank account. This paper will therefore explore a number of barriers that the underbanked face when looking to provide identity documents and the positive impact new technology can play in capturing and storing proof of identification

The inability to open a traditional bank account restricts someone's

affiliated to.

Bien que l'activité bancaire trouve ses origines dans l'octroi de financements aux paysans, puis plus tard aux hommes d'affaires de toute l'Italie (Beattie, 2017), une institution financière cherchait alors et cherche encore aujourd'hui rendre accessible à tous des financements à des prix équitables et de manière responsable. Une institution qui limite ses options de financement à certaines catégories de la population, élimine non seulement des sources de revenus potentiels, mais aussi remet en cause l'objectif d'une banque qui consiste à soutenir divers secteurs de l'économie.

opportunity to build a credit score, which is necessary if one is to present oneself as a reputable and trustworthy borrower. Therefore, many underbanked individuals are deprived of the opportunity to take out mortgages, access savings products, and utilise credit provisions from standard financial service providers. Those who want to borrow are forced to seek alternative methods of finance such as 'payday loans'. Such loans can see an average APR of 627.9%¹ and fall outside consumer protection schemes such as the FSCS Deposit Guarantee Scheme (FSCS, 2017) and do not comply with the wide array of regulations that traditional financial institutions adhere to. The underbanked then become trapped in a cycle whereby they cannot build the necessary credit score to access traditional financing. This paper will discuss how innovative approaches to credit scoring could benefit the underbanked and help them to build a holistic score that is accepted by traditional financial institutions.

Inhibitors for the underbanked

The personal cost to individuals who cannot access mainstream finance is not the only question to consider of course. The moral and financial implications for an institution that limits financing to certain segments of the population should also have weight. Not only does such

¹ On a £200 loan over 3 months (KnowYourMoney, 2017)

a policy eliminate potential revenue streams, it challenges the purpose of a bank in financially supporting diverse segments of the economy. As such, this paper will explore the benefits for a financial institution of extending financing to the underbanked, and how emerging technologies can be used to capitalise on these benefits while mitigating the associated risks.

"...inclusion is not always about the poor and 'invisible', it's about equal opportunities to access various kinds of products and services, to knowledge, innovation and the ability to make an educated choice." (Mesropyan, 2017)

Given that an estimated 1.1 billion people live without an officially recognised identity (ID2020, 2017) many underbanked customers are unable to prove either their identity, or their creditworthiness, to financial services firms.

Inability to Provide Official Identity Documentation

To open a UK bank account, it is necessary to provide two forms of documentation: proof of identity and proof of a current UK address. The following are examples of satisfactory documentation:

- Full and valid UK or foreign passport
- Full UK or foreign driving licence
- Student ID card
- UK mortgage statement

Sans le soutien d'une institution traditionnelle qui fournit un compte bancaire, les personnes « non-bancarisées » sont incapables d'accéder à des prestations d'épargne ou de crédit qui permettent de construire un historique financier et une cote de solvabilité. Cependant, afin que ces personnes puissent accéder aux services bancaires, elles doivent fournir la preuve qu'elles sont solvables et qu'elles disposent d'une identité vérifiable.

- Council tax bill
- TV license or direct debit schedule (Barclays A, 2017)

However, one should note that providing such documentation carries difficulties for many of the underbanked. Firstly, many identification documents are either too costly to obtain or irrelevant for those in low income households. For example, those who do not have the necessary funds to travel abroad or own a personal vehicle may not hold either a passport or driving license. Furthermore, proof of student identification requires the person to be in further education, either at college or university level. However 18 year-olds from disadvantaged backgrounds are nearly 2.5 times less likely to enter higher education than their more affluent counterparts (OFFA, 2017), and mature students may not be able to access funding for a course unless they can commit to full time study (Shaw, 2010) – something not possible for those looking to continue supporting a family.

Where identity documentation is held, there are further difficulties in the verification process as the majority of banks are unable to verify accounts outside of their branch network. However, because 1,032 UK bank branches have been closed in the last 2 years (Boyce, 2016), prospective customers may be forced to travel many miles to their nearest branch and to attend an appointment within work hours.

Evidently this would cause difficulty for all customers. However, for those on low income or with no fixed abode, the ability to attend these appointments may be further hampered by their lack of personal transport, or by inflexible working arrangements. Those in developing nations, where branches are more dispersed and access to official documentation may be even more costly, due to government inefficiencies or corruption, find that the same problems are magnified. All of this means that the underbanked are often unable to open a traditional bank account in order to begin their saving and borrowing journey since no bank is comfortable with the risk of lending to, or holding the finances of, an 'unknown' customer.

Inability to Build a Credit Rating

This creates a catch-22 situation where borrowing cannot be extended as there is no history on which to base a credit decision. Those who are unable to open a traditional bank account from a young age become locked out of the system and, as the period of exclusion grows, the likelihood of their accessing funding in the future decreases.

Leaving traditional financial products on one side, the underbanked may be also disadvantaged by lack of access to other routes that contribute to a credit score. These include: monthly mobile phone plans, internet subscriptions, electoral roll registration, house moves, and

Cela crée un cercle vicieux où le crédit ne peut pas être accordé puisqu'il n'y a aucun historique sur lequel baser une décision. Ceux qui n'ont pas accès aux comptes bancaires traditionnels dès leur plus jeune âge se retrouvent exclus du système et, à mesure que la durée de l'exclusion augmente, la probabilité qu'ils accèdent à un financement à l'avenir diminue.

Il est de la responsabilité des banques d'évaluer la solvabilité et les exigences d'un emprunteur potentiel et de décider s'il est prudent d'avancer les fonds.

timely bill payments (MAS, 2017).

Those from low income families may not be able to afford an internet connection, or pay-monthly mobile contracts. Those with no fixed abode or recent immigrants may have a limited record of accommodation and not be on the electoral register. In addition, those who have found difficulty in adopting more online and digital business channels, as well as mobile banking provisions, may not be able to process payments and set up facilities such as direct debits, thus affecting their ability to manage their funds with regular repayments.

However it is not only those who are unable to build a credit score who are disadvantaged but also those who have a low credit score – which impacts not only whether they can borrow but also how much, and at what cost. Therefore, those who may require financing at more affordable rates are often prohibited from accessing it – forcing them to utilise insufficient borrowing at a higher cost.

Moral Responsibility vs Profit Pressure

It is the responsibility of banks to assess the creditworthiness and requirement of a potential borrower and to decide whether it is prudent to advance monies. In such a decision, one must also consider the moral and reputational conditions around the request. This is reflected in the way many banks close the accounts of persons linked to nefarious activities and of businesses that operate in

sanctioned countries, but also – more positively – in campaigns to offer financing to socially-responsible businesses and for socially desirable projects.

In doing this, banks must formulate their own internal guidance on where these boundaries and opportunities lie, as well as seeking counsel from governments, NGOs, and lobbyists. However, whilst pressure has been exerted on banks to, for example, exit relationships with companies associated with palm oil production (Paddison, 2017), to increase financing to SMEs (Qell Group, 2017), to desist in dealing with those associated with the gambling (Wessex, 2011) and to promote green bond funds (Deutsche Bank, 2015), there has been limited pressure for banks to increase their appetite for serving the underbanked.

This is in some part due to the perceived risk/return value of an underbanked client, in which the potential for a low-income earner to not repay borrowing is deemed to be greater than the possibility of tapping a larger revenue stream, should the client be assisted with transitioning to the middle-income bracket. Similarly, since methods of assessing the borrower risk remain limited to traditional credit scoring and the collection of a limited number of documents, those who fall outside this scope are unable to demonstrate their true risk profile. Therefore they are provided with the default 'computer says no' response that is

Afin de faciliter l'évaluation de la solvabilité et la vérification sans encombres de l'identité des « non-bancarisés », les institutions financières doivent développer leurs méthodes de collecte de données et élargir l'éventail des documents acceptés. Pour ce faire, elles pourraient envisager d'utiliser les technologies biométriques et de blockchain afin de favoriser la saisie et le stockage de ces documents et également faciliter la collaboration entre les banques et le partage des données.

all too familiar to the underbanked.

The upshot is that the inability to provide identity documentation and build up a credit score inhibits the underbanked from utilising traditional banking provision. In addition, it limits potential revenue streams for institutions that, due to slowdowns in global markets, increasing regulatory requirements and competitive pressure from the *fintechs* (financial technology companies), increasingly find their margins under pressure. Institutions need to strike a balance between meeting shareholder expectations and having too much risk appetite, and to understand how segments, such as the underbanked, can be responsibly served.

This paper will explore how the growth of emerging technologies, and innovative application of digital services within the wider financial ecosystem, brings new opportunities to improve financial inclusion for the underbanked whilst mitigating the associated risks.

Biometrics and Blockchain Technology: Identity Documentation Capture and Storage

In order to facilitate frictionless identity verification for the underbanked, financial institutions must expand their data collection methods and the range of accepted documents. To do this, they could look to implement biometric and blockchain technology to aid the capture and storage of these

documents and also better facilitate cross-bank collaboration and data sharing.

Biometric Technology – The Basics

This is most easily seen in common biometric applications such as fingerprint and iris scanners. A fingerprint scanner uses infrared waves to map a person's unique fingerprint, encrypt the data into a string of 1's and 0's, and then store the digital representation of the fingerprint within the device's memory. When one wishes to access the phone, this digital record can be accessed and verified by presenting the required finger onto the touchpad.

The above is an example of single-factor authentication, in which one attribute must be presented. However there is a growing move towards multi-factor authentication where multiple attributes must be presented in order to gain access to an account, device, or product. In this, users are prompted to provide something they know (e.g. a password); something they are/have (e.g. a fingerprint); and something they do (e.g. typing pattern). This is an augmentation of the traditional password-only account access, which financial institutions required for their online and early mobile offering. However, due to a conflict between cybersecurity concerns and customer pressure to streamline account access, the majority of banks now offer some level of multi-factor authentication.

Biometric Solutions for Identity Collection and Verification

L'identification par smartphone, qui couvrirait 81% des adultes au Royaume-Uni, facilite l'accès des personnes « non-bancarisées » à un compte bancaire. Les avantages de l'identification via application mobile sont particulièrement adaptés aux marchés émergents, où sur les 2,2 milliards d'adultes sans accès aux services bancaires traditionnels, environ 46% de la population possède un smartphone (GSMA, 2016). De ce fait, la prolifération des téléphones mobiles – associée à une préférence de 93% des consommateurs pour la biométrie par rapport aux mots de passe – peut aider ceux qui vivent dans des zones reculées à accéder à des produits financiers.

HSBC (HSBC, 2017) was an early pioneer in voice biometrics for telephone bank account access and Lloyds introduced TouchID (fingerprint access) to its mobile app in 2016 (Fintech Ranking, 2016) capitalising on the way in which fingerprint readers on smartphones had become increasingly common (Deloitte A, 2016). Whilst the majority of this innovation focusses on account access for those who have existing bank accounts, advances are also being made in using biometric authentication and verification to improve access to financial provision for the underbanked.

An example of the cycle of small improvements that aims to remedy the difficulty in branch-based authentication can be seen at challenger bank Monzo, which uses facial recognition technology within their mobile-only offering to on-board all customers. Monzo customers are required to provide a photo (taken using their mobile) as one piece of identification as well as a video 'selfie'. Their identity is verified using face matching technology and an account can be requested and opened within 7 days.

This means that, for those able to provide a form of verification with a smartphone, which 81% of UK adults are (Deloitte B, 2016), Monzo removes the obstacle of in-person branch account opening.

That gives the underbanked quicker, easier access to a bank account. The advantages of mobile-based identification collection are especially relevant within developing markets where, of the 2.2 billion adults without access to traditional banking services, an estimated 46% of the population own a smartphone (GSMA, 2016). Given this, the proliferation of mobiles – together with a 93% consumer preference for biometrics over passwords (Ball, 2017) – can help those who live in remote areas access financial products.

The Impact of Biometric Technology for the Underbanked

Three pioneering projects are: the ID2020 global project, the UK government's GOV.UK Verify initiative, and India's Aadhaar project. These aspire to create digital identities that can be stored on a national database and accessed by corporates and financial institutions for identity verification. Aadhaar, which is a unique personal 12-digit identity number, has been provided to over 99% of all Indian citizens (Wikipedia, 2017) and includes personal information such as name, address and birth date but also biometric information with 10 finger scans and an eye scan. This data can be used by all citizens as a government supported identification document. Similarly, the GOV.UK Verify scheme (GDS, 2017) and ID2020 (ID2020, 2017) projects

Les projets de vérification numérique fourniraient aux personnes « non-bancarisées », qu'elles soient issues des pays développés ou en développement, une pièce d'identité qui pourrait être acceptée par les institutions financières. Ceci, combiné avec les progrès de la banque multi-canal, pourraient offrir un accès sans encombres aux non ou mal-bancarisées. Malgré cela, il convient de souligner que pour ceux qui n'ont pas de domicile fixe, d'autres étapes peuvent s'avérer nécessaires afin de contourner la difficulté liée à la précarité de leur lieu de résidence. Cependant, la nature numérique du projet fait que celui-ci est plus adapté à des mises à jour en temps réel grâce à des applications mobiles et à la localisation par GPS.

look to provide a nationally accepted proof of identity to all citizens at zero cost to the consumer.

These projects would provide the underbanked, whether in a developed or developing nation, with an identity document that could be accepted by financial institutions. This, paired with advancements in omni-channel banking, could provide frictionless access to banking provisions for the underbanked. Despite this, one should note that for those with no fixed abode, further steps may be required in order to accommodate their unsettled location. However the digital nature of the project may more easily lend itself to real-time updates through mobile and GPS tracking.

Blockchain Technology - The Basics

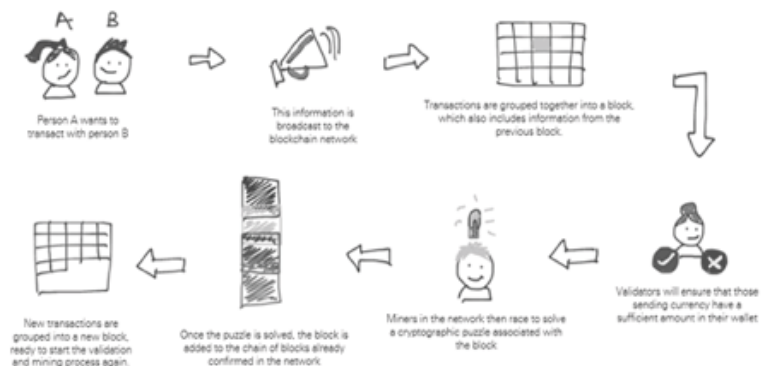
Blockchain technology was conceived in a 2008 whitepaper proposed by an anonymous creator using the pen-name Satoshi

Nakamoto. It underpins the cryptocurrency bitcoin, an electronic peer-to-peer cash system. However the value of blockchain technology has since been recognised outside of this application and is now being explored by financial institutions worldwide, including its potential to improve provisions for the underbanked.

A blockchain is a shared ledger that records transactions and distributes an updated copy to all participants in the network, in near-real time. Transactions are grouped together in blocks and connected to previously verified blocks in order to form an immutable chain that records the entire history of transactions – hence the term blockchain (diagram 1).

The transactions within each block are verified to ensure that those who are attempting to send funds have the required amount in their accounts. Then, those who

Diagram 1:



(Image: Tara Annison)

Si la création d'une identité numérique offre de nombreuses opportunités aux personnes « non-bancarisées », elle s'accompagne d'un risque accru de vol d'identité par le biais de cyberattaques. En tant que telle, la technologie de blockchain permet de protéger l'identité grâce au recours à un registre distribué et immuable, vérifié par la cryptographie, laquelle fournit une seule source de vérité, sans aucune défaillance.

help to maintain the blockchain network (called miners), must solve a mathematical problem associated with the particular block in order to be able to add it onto the chain. This helps the network reach consensus as significant computing effort must be employed by the miners to ensure only valid blocks are added to the blockchain. Once a solution is found, it is broadcast to the wider network and consensus can be reached. After this point, new transactions are added to another block and the process begins again.

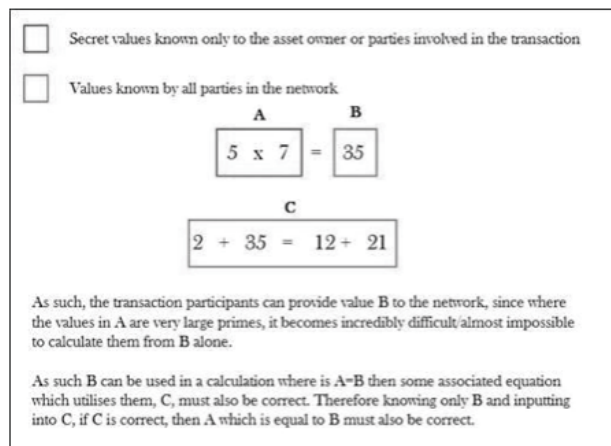
Crucially, and unlike traditional ledgers employed within the financial services industry, there is no single copy of the ledger – it is distributed to all participants in the network, without the need for a central counter-party. This helps to provide the security of a blockchain because there is no single point of failure and anyone attempting to

'hack' the blockchain would need to hack every copy of the blockchain in existence.

Blockchain Solutions to Identity Storage

Importantly, this verification can be completed without the content of the underlying asset being made visible to all on the network. This is achieved by encrypting the information before it is uploaded. The decryption keys are shared between the asset owner e.g. the individual and a trusted stakeholder e.g. a benevolent government. As such, access to the underlying content can only be granted should both the asset owner and stakeholder agree. Furthermore, developments in blockchain technology through zero-knowledge proofs (diagram 2) and confidential transactions can allow for information to be validated in encrypted form, allowing for digital

Diagram 2:



(Image: Tara Annison)

En établissant des cotes de solvabilité pour les personnes « no-bancarisées », les banques peuvent tirer parti de la modélisation statistique des profils de risque qui intègrent une grande variété d'indicateurs. Elles pourraient aussi potentiellement utiliser la technologie du blockchain comme une alternative moins coûteuse à l'infrastructure existante. On estime que les applications de blockchain peuvent faire économiser aux banques environ \$ 20 milliards par an, à travers des gains d'efficacité dans les « middle- et back office », y compris des coûts réduits de traitement des transactions. Par conséquent, il pourrait devenir financièrement possible d'octroyer des prêts de microcrédit aux « non-bancarisés », si les banques, aidées par le blockchain et d'autres technologies émergentes, opéraient dans un contexte de coûts moins élevés.

identity stored on a blockchain to be verified by a third party without revealing the details of the underlying identity information.

Examples of blockchain use for identity storage include the secure identity platform Civic (Civic, 2017) and an initiative led by SecureKey Technologies and IBM (IBM, 2017) who have partnered with leading banks in Canada to build the first ever digital identity network, allowing for the cross-referencing and verification of identities across banks. That means that, should someone be able to provide their digital identity to a bank in Canada, it can also be shared across all other participants in the network in a secure, immutable format. For the underbanked, this secure and distributed network alongside initiatives such as Gov. UK Verify, provides the opportunity to share their digital identity across institutions. This will reduce costs associated with multiple documentation requests and allow greater access to an array of financial products.

However, whilst these innovations look to provide a source of digital identity for the underbanked, a challenge remains around how the underbanked can provide assurance of their creditworthiness to a financial institution.

Blockchain Solutions to Identity Storage

As the use of mobile phones has increased exponentially, so interactions on social media and on

applications such as Whatsapp and WeChat have become a dominant form of communication. Technology companies have taken advantage of the data collected by such interactions to provide a holistic personal risk profile. Two companies that utilise such data to provide an alternative credit score are Tala and DeMyst Data.

Holistic Credit Scoring

Tala (Tala, 2017) is a mobile based fintech (financial technology company) that provides micro-financing in developing markets. It assesses the risk profile of customers using their mobile phone profile. By analysing over 10,000 data points per customer including regularity of calls to family and friends, geographical location, finance-related apps on the device, and size of support network, financing can be extended to borrowers within 2 minutes, after asking only 8 questions (Adams, 2016). Whilst the app initially saw default rates of 50-60%, an augmentation of the risk algorithms later reduced this to less than 10% and has resulted in some interesting repayment metrics:

- High regular travel patterns are linked to increases in repayment rates of 4%
- Regular contact with the same family and friends is correlated with a 6% uptick in repayment rates
- A high number of contacts with whom the client is in regular context is associated

Les banques jouent un rôle pivot dans l'économie et dans les opportunités qui s'offrent dans la vie d'un individu. Les « non-bancarisées » auxquelles on donne un accès à des financements auraient une opportunité d'emprunter pour acheter des biens et des services à coûts plus élevés, tels que des véhicules ou des formations supplémentaires. Ils auraient également accès à des produits d'épargne sûrs et à des services bancaires en ligne. Dans l'ensemble, les banques offriraient aux « non-bancarisées » une opportunité d'élever leur degré d'accomplissement et leur niveau de stabilité financière. Il y a aussi une dimension morale : les décisions de crédit des banques peuvent avoir un impact significatif sur la qualité de la vie et les opportunités que l'on peut avoir.

with a boost in repayment rates of 9% (Siroya, 2016)

For the underbanked this provides an opportunity to access financing outside the traditional lending model, at affordable rates, and to build a traditional credit score. For Tala it provides margins comparable to those seen at traditional institutions – and all from a segment deemed 'too risky' to bank.

Another company looking to harness mobile data for credit scoring is Demyst Data. It aims to combine both internal and external data sources in order to build the credit profile of a customer. This includes data from governments, from geolocation services and from social media platforms, email and networks. Corporations who leverage the technology have seen a 20% increase in new customers with the same risk level and 45% fraud reduction (Demyst Data, 2017). As such, the implementation of technologies such as this by financial institutions could allow the underbanked to demonstrate their true risk profile by leveraging the plethora of data available, moving beyond the oversimplified traditional credit score.

Micropayments

This is where a short-term, small (sub \$1,000) loan is extended – representing a low capital expense for the bank but providing the borrower with the opportunity to repay funds – therefore possibly improving their credit score.

An example of a fintech utilising micropayments to credit score is Company Mission Asset Fund. It extended microfinancing to 600 low-income individuals based solely on the security provided by signed promissory notes. Of the 260 borrowers which San Francisco State University studied in a two-year review of the project, the average credit score increased by 168 points to reach 603 points (Ashoka, 2013).

This allows a segment of the underbanked to access non-traditional financing whilst improving their credit score. That boosts the possibility that, should they later apply for a financial product with a traditional institution, their request will be accepted.

However, the incumbents are currently restricted in their ability to offer micro-financing because of high overhead costs. These are a result of: inefficient back-end credit processing, primitive risk models that require high levels of capital to be ring-fenced for those within the underbanked category, and of expensive monitoring processes for account utilisation and repayment tracking. However, many institutions are now exploring blockchain technology as a lower-cost alternative to existing infrastructure, and as a replacement for heritage systems. Existing systems are unable to leverage technological advancements due to their inflexible design and as such cannot take advantage of innovations. However implementations of blockchain

Les banques qui offrent leurs services aux «non-bancarisées», en utilisant la technologie pour atténuer les risques, démontreront un engagement aussi bien envers les personnes que les profits. Cela pourrait contribuer à corriger certaines des perceptions négatives des institutions financières qui se sont développées depuis la crise financière globale de 2008/09 – en partie causée par les banques qui se sont concentrées sur les profits plutôt que sur les besoins des emprunteurs.

technology are estimated to save banks an estimated \$20billion a year (Perez, 2015) in middle-to-back office efficiencies, including reduced transaction processing costs. Therefore it could become financially feasible to provide micro-finance loans to the underbanked, should banks, facilitated by blockchain and other emerging technologies, operate in a lower cost environment.

Morality and Responsibility: Opportunity Capitalisation and Risk Management

The ability of a bank to lend responsibly and fairly contributes to its reputation, therefore a bank with high default rates, an inability to provide access to customer savings, and aggressive sales or repayment tactics, may be perceived negatively. However, a bank that looks to provide financing to those in need, provide a truly omni-channel service, and display a considered but sensible risk appetite, will be understood as serving its customer base.

That is why institutions should look to capitalise on incoming regulations such as PSD2, which mandate data sharing and closer collaboration with fintechs, in order to improve their offering to the underbanked. An example of an app that caters to the underbanked market and could be assimilated within a larger bank offering is Squirrel (Squirrel, 2017), which is designed for low income households

and diverts wages into a special account without immediate access. This helps to prevent overspending through the release of small timely payments. Furthermore the use of pre-paid cards such as The Acorns Card (Acorn Accounts, 2017) provides banking services without the ability to enter into unauthorised debt and with automatic saving provisions.

Banks that serve the underbanked, utilising technology to mitigate the risks associated, will demonstrate a commitment to people as well as to profits. This may help to address some of the negative perceptions of financial institutions that have been held since the 2008/09 global financial crisis – in part caused by banks placing greater emphasis on revenue rather than the needs of borrowers. Addressing the needs of the underbanked could help to remove the stigma of ‘bad bankers’ (Corrigan, 2008).

This is especially important as banks play a pivotal role in the economy and in opportunities within an individual’s life. The underbanked who are given access to finance would have an opportunity to borrow to pay for higher cost goods and services, such as vehicles and further education. They would also have access to secure savings products and to online banking. Overall, banks would be providing an opportunity for the underbanked to raise their attainment and level of financial stability. There is also a moral dimension to this: the credit

decisions that banks make can significantly impact the quality of life and the opportunities that one may have.

By responsibly extending fairly-priced finance to the underbanked, financial services firms could give them opportunities to help themselves.

Conclusion

Technological improvements in biometrics can assist with personal data collection and identity verification for the underbanked, who have restricted access to branch-based banking or who do not have traditional, and costly, documentation. The implementation of blockchain technology can help to securely manage this digitally-created identity and provide the opportunity for collaboration and data sharing between banks. That means that different institutions could augment an identity profile – thereby removing the burden of verification and authentication from one bank alone and reducing the perception that the underbanked are ‘unknown’.

Furthermore, a holistic approach to credit scoring can help banks better understand the true risk-profile of an underbanked customer by capitalising on the vast array of personal data collected through mobile and online interactions. That would allow financing to be extended to those in need without compromising an institution’s financial stability.

Finally, we should consider the fundamental role of financial institutions in society and how the erosion of trust, thanks to previous destructive market activity, has impacted customers. Extending financing to many of those most in need, the underbanked, could assist in improving the reputation and image of banks. It also provides the underbanked with an opportunity to utilise this funding to improve their own personal circumstances.

All in all, the technology outlined in this paper can help banks capitalise on this opportunity whilst mitigating the associated risks.

References

- Acorn Account (2017). How it works. Retrieved from <https://www.acornaccount.com/bank-account/howitworks.html>
- Adams, S. (2016). How Tala Mobile Is using phone data to revolutionize microfinance. *Forbes*, 29 August. Retrieved from <https://www.forbes.com/sites/forbestreptalks/2016/08/29/how-tala-mobile-is-using-phone-data-to-revolutionize-microfinance/#3636e5c32a9f>
- Ashoka (2013). Banking the unbanked: a how-to. *Forbes*, 14 June. Retrieved from <https://www.forbes.com/sites/ashoka/2013/06/14/banking-the-unbanked-a-how-to/#7732cdd25727>
- Ball, T. (2017). Biometrics beat passwords for 93% of UK consumers. *Computer Business Review*, 13 June. Retrieved from <http://www.cbronline.com/news/cybersecurity/protection/biometrics-beat-passwords-93-uk-consumers/>
- Barclays A (2017). Identification for bank Accounts. Retrieved from <http://www.barclays.co.uk/validid>
- Barclays B (2017). Logging into online banking. Retrieved from <http://www.barclays.co.uk/Helpsupport/LoggingintoOnlineBanking/P1242604492621>
- Beattie, A. (2017). The Evolution of Banking. Retrieved from <http://www.investopedia.com/articles/07/banking.asp>
- Boyce, L. (2016). Bank closure map of the UK: more than 1,000 branches have closed in just 2 years - and HSBC has cut more than a quarter of its network. *This is Money*, 14 December. Retrieved from <http://www.thisismoney.co.uk/money/saving/article-4029140/Mapped-1-000-high-street-bank-branches-closed-just-two-years-HSBC-cut-quarter-network.html>
- Chaia, A. Goland, T. Schiff, R. (2010). Counting the world's underbanked. Retrieved from <http://www.mckinsey.com/industries/financial-services/our-insights/counting-the-worlds-unbanked>
- Corrigan, T. (2008). Financial crisis: bad banker. Now take your punishment. *The Telegraph*, 10 November. Retrieved from <http://www.telegraph.co.uk/finance/comment/tracycorrigan/3427721/Financial-crisis-Bad-banker.-Now-take-your-punishment.html>
- Civic (2017). Secure Identity Platform. Retrieved from <https://www.civic.com/secure-identity-platform>
- DemystData (2017). Mobilizing the world's data to unlock financial services. Retrieved from <http://demyst.com/>
- Deloitte A (2016). There's no place like phone: Consumer usage patterns in the era of peak smartphone. Retrieved from <https://www.deloitte.co.uk/mobileuk/assets/>

[pdf/Deloitte-Mobile-Consumer-2016-There-is-no-place-like-phone.pdf](#)

Deloitte B (2016) SUMMARY - There's no place like phone: Consumer usage patterns in the era of peak smartphone. Retrieved from <https://www.deloitte.co.uk/mobileuk/>

Deutsche Bank (2015). Deutsche Bank supports guidelines for green bonds. Retrieved from <https://www.db.com/cr/en/concrete-Deutsche-Bank-supports-guidelines-for-green-bonds.htm>

Financial Inclusion Commission (2016). The Facts. Retrieved from <http://www.financialinclusioncommission.org.uk/facts>

Fintech Ranking (2016). Lloyds implements Touch ID. Retrieved from <http://fintechranking.com/2016/09/16/lloyds-bank-implements-touch-id/>

FSCS (2017). Your money is protected in UK banks, building societies and credit unions from £1 to £85k. Retrieved from https://protected.fscs.org.uk/?gclid=EAIaIQobChMIqbDAmceY1QIVgqntCh31NgFTEAAYASAAEgIfmvD_BwE

Government Digital Services (GDS) (2017). Guidance: GOV.UK Verify. Retrieved from <https://www.gov.uk/government/publications/introducing-govuk-verify/introducing-govuk-verify>

GSMA (2016). The Mobile Economy - Africa 2016. Retrieved from <https://www.gsma.com/mobileeconomy/africa/>

HSBC (2017). HSBC Voice ID making telephone banking safer than ever. Retrieved from <https://www.hsbc.co.uk/1/2/voice-id>

ID2020 (2017). An Alliance Committed to Improving Lives Through Digital Identity. Retrieved from <http://id2020.org/>

IBM (2017). Blockchain for Digital Identity: Build a trusted digital identity network with IBM blockchain. Retrieved from <https://www.ibm.com/blockchain/identity/>

Know Your Money (2017). How much do you want to borrow?. Retrieved from http://www.knowyourmoney.co.uk/short-term-loans/?gclid=EAIaIQobChMIyOiRkb6T1QIVxpXtCh0wBARCEAAYAiAAEgK5vvD_BwE

Mesropyan, E. (2017). The Multilateral Concept of Inclusion: Going Beyond the Formal Financial System. Retrieved from <https://letstalkpayments.com/multilateral-concept-of-inclusion/>

Money Advice Service (MAS), (2017). How to improve your credit score. Retrieved from <https://www.moneyadviceservice.org.uk/en/articles/how-to-improve-your-credit-rating>

NatWest (2017). Card-reader. Retrieved from <http://personal.natwest.com/personal/ways-to-bank/>

[online-banking/do-more-with-online-banking/card-reader-how-to-use-your-card-reader.html](#)

OFFA (2017). Quick Facts. Retrieved from <https://www.offa.org.uk/press/quick-facts/>

Paddinson, L. (2017). HSBC triggers investigation into palm oil company over deforestation allegations. Retrieved from <https://www.theguardian.com/sustainable-business/2017/jul/17/hsbc-investigation-palm-oil-company-deforestation-allegations-noble-plantations>

Perez, B.Y. (2015). Santander: Blockchain tech Can save banks \$20billion a year. *CoinDesk*, 16 June. Retrieved from <https://www.coindesk.com/santander-blockchain-tech-can-save-banks-20-billion-a-year/>

Qell Group (2017). UK government signs deal with big banks to increase SME lending: Retrieved from <https://qell.co.uk/uk-government-signs-deal-with-big-banks-to-increase-sme-lending/>

Shaw, E. (2015). Can You Afford To Go To University As A Mature Student? Retrieved from <https://www.saga.co.uk/magazine/money/work/careers/can-you-afford-to-be-a-mature-student>

Siroya, S. (2016). A smart loan for people with no credit history (yet). Retrieved from https://www.ted.com/talks/shivani_siroya_a_smart_loan_for_people_with_no_credit_history_yet

Squirrel (2017). Meet Squirrel: The App That Gets you Better at Saving and Spending in Seconds!. Retrieved from <https://squirrel.me/works>

Tala (2017). Complex Data. Innovative Solutions. Retrieved from http://tala.co/#block-17_2_5_1470266915823_13410

Wessex (2011). Banks that stop you using your account for betting. Retrieved from http://community.betfair.com/general_betting/go/thread/view/94082/28263669/banks-that-stop-you-using-your-accounts-for-betting#flvWelcomeHeader

Wikipedia (2017). Aadhaar. Retrieved from <https://en.wikipedia.org/wiki/Aadhaar>