Blockchain Technology for Reputation Scoring of Financial Actors

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Finalist

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* The views expressed herein are those of the author and do not necessarily reflect those of the Organization he is affiliated to.

There is currently no clear method of publicly and transparently displaying the conduct of financial professionals. Individual 'rogue traders' might be recognisable through the media, and regulatory directories – such as the Financial Services Register of the Financial Conduct Authority (FCA) – provide some information, but it remains difficult for members of the public to assess the record of any particular professional.

Reputation is highly important *within* the closed networks of financial sector professionals. Many care about how they appear to their peers and prospective employers. The lack of external public recording of reputation markers, however, sets up a dynamic in which financial insiders feel accountable to other insiders, but not to the broader world.

To alter this dynamic, I propose a public reputational scoring system for financial professionals, or financial firms, based on the underlying technology used by the Bitcoin cryptocurrency system. Implementing such a system will create a new disincentive for financial professionals to engage in unethical practice, and furthermore, could encourage a range of positive behaviours.

First introduced in 2009, Bitcoin has emerged into popular consciousness over the last few years. It has been the cause of both excitement and controversy, but it has undeniably opened up the innovation landscape to some hitherto unimagined possibilities. In particular, the underlying *blockchain* ledger it is based on has the potential to be adapted to create global systems for recording data in a highly participatory, public and transparent way.

Il n'existe pas à ce jour de méthode pour apprécier de manière claire et transparente la conduite des professionnels de la finance. Pour pallier cela, je propose une notation réputationnelle pour les professionnels ou les entreprises de la finance basée sur la technologie "blockchain" (chaînage de blocs) utilisée par Bitcoin. Cette technologie peut être adaptée pour développer un système global d'enregistrement participatif et transparent de données. La mise en place d'un projet pilote en matière réputationnelle du type "blockchain" pourrait dissuader les professionnels à s'engager dans des pratiques non éthiques et devrait encourager des comportements positifs.

Dans le cas de paiements électroniques interbancaires, la banque garde la trace de notre avoir sur son registre privé qu'elle contrôle pleinement. Pour déplacer cet avoir vers un autre compte, il faut d'abord s'identifier comme propriétaires à l'aide d'un PIN code, puis demander que l'autre banque

This technology is very new, and the purpose of this proposal is to sketch out possible routes to implementing a pilot blockchain reputation scheme. This proposal sets out the broad concept and points to a number of different ways of implementing the idea technically. The good news is that banks are actively exploring this area, so research and implementation partners and resources may be forthcoming.

Below I sketch out four foundations of this project, and then move into describing two possible varieties of a reputational blockchain system. Finally, I conclude with an outline for next steps

Foundation 1: The original Bitcoin cryptocurrency system

The simplest way to describe the Bitcoin system[1] is as follows. It consists of:

• A decentralised public ledger, or database, called the 'blockchain'

• …that people can use to record transactions between themselves

• …and thereby 'keep score' of their money – or *tokens* on the system – in a highly public and transparent way

To understand the Bitcoin system, it is useful to sketch out the similarities and differences it has to our normal bank payments system. In our normal system, a person has:

1 There is a large literature describing Bitcoin, but perhaps the best resource is Antonopoulos (2014)

1. An account number at a bank, and

2. A way of proving that they control that account number. For example, they have a PIN code

3. The bank, in turn, has a data record of how much money is attributable to that account number, thereby 'keeping score' of the person's money on a private internal database or ledger

4. The person can then use an electronic communications system to identify themselves to their bank as the authentic account holder, and can request for the money associated with their account number be transferred to someone else's account at a different bank

5. This then spurs the bank to edit their ledger of accounts – changing the person's 'score' – and to tell the recipient's bank to do the same. The process is a little more complex than this, but in effect the money 'moves' via a series of private ledgers being edited

Likewise, in the Bitcoin system, a person has a *public address* (akin to an account number), and a *private key* (akin to a PIN number). They then use an electronic communications system to identify themselves to the *Bitcoin network of miners*, and request that their tokens – associated with their public address – be moved to someone else's public address. This then occurs by a change made to the blockchain ledger. The two parties who control the public addresses can then see these changes, proving

soit avertie et qu'elle accueille la somme sur son registre. Dans le système Bitcoin, la personne a une adresse publique (comme un numéro de compte) et une clé privée (comme le PIN code). Elle peut s'identifier à l'aide du PIN code et demander que l'avoir soit déplacé vers une autre d'adresse. Le transfert s'effectue grâce à un réseau de "mineurs" qui opère le changement sur le registre public appelé "blockchain" que les deux parties peuvent voir. C'est donc ce registre qui garde la trace de manière accessible à tous de la monnaie.

La particularité du "blockchain" tient au fait qu'il passe par un registre public, décentralisé, entretenu par un réseau et qu'il offre aux participants la possibilité d'éditer ce registre. Ce dernier se développe de manière incrémentale par l'action des participants utilisant un même software. Si toutefois on modifie le code du programme, la nature du registre obtenu change en conséquence. Cette possibilité a suscité un

that the tokens have 'moved' from one address to the other.

The key difference between the Bitcoin system and the normal bank payments system is two-fold. Firstly, the intermediaries that change the ledger are a *decentralised* network of people ('miners') running special Bitcoin software, rather than banks running their own private software systems. And secondly, the ledger they change is *public*, rather than the privately held account ledgers of the normal banking system.

Thus, despite Bitcoin's media association with secrecy, the key feature of the blockchain technology is *highly visible public transparency*. This is easily observable on websites like blockchain.info, where one can see real-time Bitcoin transactions being publicly recorded onto the blockchain ledger. For example, one can use the site to find out how much is attributable to public address '1ATMraQwtXcN9b1Jr51cWotfp5e-FGdTjM4'[2].

Foundation 2: The wave of 'blockchain 2.0'

The Bitcoin system described above has been subject to many different types of critique and acclaim. One thing most interested parties agree on, though, is that the underlying concept of a *decentralised public ledger, collectively maintained by a network, and with a means for*

participants to edit that ledger is very important. This has led to a nascent interest in 'blockchain 2.0' projects, or the use of a blockchain ledger to record things other than currency transactions.

Early examples of this that emerged include systems like:

• Namecoin: A decentralised registry for website domain names

• Proof of Existence: A notary system that uses the blockchain to record possession of documents at a particular time

At the cutting edge of the scene are experiments with 'smart contracts', which are small bundles of code – or 'scripts' – that can be recorded on a blockchain, and that participants can interact with in order to undertake simple tasks. These can form the basis for 'decentralised autonomous organisations', or 'decentralised collaborative organisations'[3], useful entities that are held in play on a decentralised network of computers, rather than controlled by a single management team.

Groups like Ethereum, Counterparty and Blockstream are working on building platforms to allow people or start-ups to implement blockchain-based systems. For example, *Provenance* is a start-up attempting to use the Ethereum system to create a highly transparent ledger of global corporate supply chain data[4].

Much of the interest in 'block-

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2 To view that particular address, visit https://blockchain.info/address/1ATMraQwtXcN9b1Jr51cWotfp5eFGdTjM4

3 For an good overview of these entities, see Bollier *et al.* (2015)

4 See website at https://www.provenance.org/

grand intérêt dans les projets "blockchain 2.0" qui se basent sur un registre blockchain pour enregistrer d'autres données que les transactions monétaires. Cette technologie peut être ainsi utilisée pour des services décentralisés comme des assurances et pour la mise en place pour allouer des "jetons" réputationnels.

L'industrie financière s'intéresse à la technologie du blockchain. Ainsi, UBS a annoncé qu'elle projette de mettre en place 'Blockchain Innovation Lab', Barclays soutient des start-ups qui utilisent cette technologie, alors que RBS, Rabobank, ING et BNY Mellon jouent avec cette idée.

A l'heure actuelle, un système public de notation réputationnelle adapté aux activités financières fait cruellement défaut. Il existe des systèmes publics comme le Registre de la Financial Conduct Authority britannique. Il permet de passer en revue l'historique professionnel et disciplinaire des professionnels enregis-

chain 2.0', though, concerns potential financial services applications. For example, Michael Mainelli from Long Finance published a December 2014 research paper called 'Chain Of A Lifetime: How Blockchain Technology Might Transform Personal Insurance'[5]. Others are looking into derivatives systems, and crowdfunding systems.

The technical details of these schemes can appear complex, but there are two key takeaway points.

Firstly, it is useful to think of a blockchain as a database that is incrementally built up by a network of participating parties who run the same software, and that is subject to the constraints and rules set by the underlying software they run. A blockchain, as the name suggests, gets built up by blocks of data gradually being 'chained' together. It could almost be imagined as a spreadsheet that is gradually built by new cells being chained on. A blockchain database continues to be built and maintained so long as the software continues to be run. Thus, unlike a centralised database held by a single entity, it continues to stay 'alive' even if individual participants pull out (or go bust, for example). It creates an indelible record, resistant to tampering by any individual party.

Secondly, if you tweak the code of the underlying software being run by participants, the nature of the resultant blockchain changes, ope-

5 Mainelli & von Gunten (2014)

ning the possibility of creating blockchain databases storing all manner of diverse data, including reputation tokens.

Foundation 3: The increasing interest in blockchain technologies

The financial industry is showing real curiosity towards cryptocurrencies, and also in the underlying blockchain technology. Here are some examples:

• UBS has announced plans to set up a 'blockchain Innovation Lab' at Level 39 in Canary Wharf (*Wall Street Journal*, 2015a)

• Barclays have included blockchain insurance start-ups in their Barclays Accelerator (*Coindesk*, 2015b)

• Well known investment banker Blythe Masters (the former head of JP Morgan's commodity trading division) has announced plans to explore blockchain systems, stating that they have the potential to build renewed trust in financial institutions (*Coindesk*, 2015a)

• Banks like RBS and others have been hosting blockchain 'hackathons', and Rabobank has been setting up challenge prizes for ideas on blockchain use (*Finextra*, 2015). Others like ING have been hiring researchers on the topic (*ING Careers*, 2015)

• The bank BNY Mellon is testing a blockchain-based token system as an internal incentive scheme for staff members under their corporate recognition programme (*Wall Street Journal*, 2015b)

trés. Cependant, de tels systèmes ont une teinte bureaucratique, peu de visibilité publique et sont, en fin de compte, peu utiles. De plus les informations importantes leur échappent : bien que Kweku Adoboli, le trader escroc, ait été condamné à plusieurs années de prison, cette nouvelle n'apparaît pas dans le registre de la FCA.

Nous avons donc besoin d'un système de notation réputationnelle plus efficace, accessible globalement et continuellement mis à jour. Je propose donc de créer une base de données "blockchain" qui pourrait être utilisée pour enregistrer les cas d'inconduite, mais aussi des cas d'actions positives de la part des professionnels de la finance, ou des entreprises. Il y aurait ainsi une trace publiquement accessible de la qualité éthique de leurs activités.

Une voie possible serait la mise sur pied d'un système de "karma" au niveau individuel. Dans le système Bitcoin, les participants reçoivent une adresse

• Central banks like the Bank of England have taken an active interest in blockchain innovation (*Bank of England*, 2014)

We thus have a situation in which banks and other financial institutions are actively exploring the emerging blockchain innovation scene, and looking for ways to show their relevance within it. This presents a significant opportunity to advance novel blockchain proposals, get banking partners on board, and secure resources to investigate pilot projects.

Foundation 4: The lack reputation scoring systems

There are government systems like the UK Financial Conduct Authority's Financial Services Register[6] that have a reputational element to them. It enables one to search for financial firms and registered financial professionals, and to look up information such as basic employment history and disciplinary record.

That said, it has a private, bureaucratic feel, tucked away on the FCA website with little publicity and low usability. Very few financial professionals will feel that the register is something that the public can actively engage with. Furthermore, it is questionable whether it shows relevant information. Take, for example, the high-profile case of rogue trader Kweku Adoboli. His FCA register record on 9th April 2015 has no information recorded under the heading

'disciplinary history'[7], despite being sentenced to several years in prison.

Furthermore, if you are an individual outside the UK, it is unlikely that you will readily know the local regulator or be aware of the internal registry systems in place. Each country has a different version, but large financial firms are *de facto* global in their operations.

There have been private attempts to create ethical scoring systems for banks. For examples, Fair Finance Guide, MoveYourMoney UK, and Ethical Consumer have created 'scorecard' systems at different times. These can be useful to put public pressure on banks to maintain ethical standards, but are not regularly updated and tend to be based on private research that is hard to maintain without consistent resources being poured into them. If the groups stop producing the research, the record goes out of date and gradually disappears.

Blockchain-based reputation systems

What is required, therefore, is a more effective, globally accessible reputation system that is updated regularly and continues to exist even when individual organisations cease to operate. Thus I propose using blockchain technology to create:

1. A decentralised public ledger, in the form of a blockchain database

2. …that people or organisations can use to record cases of financial

6 See register here http://www.fsa.gov.uk/register/home.do

7 See Adoboli entry here http://www.fsa.gov.uk/register/indivDiscHistory.do?sid=598330

publique qui permet d'envoyer et de recevoir des jetons d'autres adresses en obéissant à des règles codées qui soutiennent le réseau. Si on change ces codes, les règles s'en trouvent modifiées. Il serait ainsi envisageable de donner des compétences variées à divers participants. Cela permettrait de mettre au point un système où les professionnels de la finance pourraient accumuler sur leurs adresses publiques des jetons (karmas) positifs et négatifs qu'ils recevraient d'autres participants désignés à l'avance. Pour y parvenir, chaque professionnel recevrait une adresse dans le système. Des instances telles que Financial Conduct Authority ou ICAEW (Chartered Accountants Institute) seraient habilitées à envoyer des jetons positifs de "reconnaissance professionnelle" quand la personne passe les examens correspondants. Les mêmes enverraient des jetons négatifs (karma négatifs) en cas d'inconduite professionnelle, de ventes abusives ou de manipulation de marchés. Afin d'encou-

misconduct or cases of positive actions by financial professionals (or firms)

3. …and thereby 'keep score' of financial professionals' (or firms') ethical record in a highly public and transparent way.

If it can be implemented, such a ledger could serve as a useful tool to the public, a disincentive to financial professionals to engage in misconduct, and an encourager of positive behaviours from financial firms and their employees.

The precise technical details of such a scheme remain undeveloped, but the purpose of this proposal is to set out directions for a feasibility study and potential pilot phase. Described below are two possible implementations of the idea.

Implementation concept 1: An individual 'karma' system

In the existing Bitcoin system, participants have public addresses that can receive and dispatch tokens to other public addresses, using the coded rules of the system. Through this process, the participants gradually create a public blockchain record.

The nature of the blockchain and the rules for submission onto that blockchain are defined by the software, independently run by the network of participants. If, however, we alter the code, we can change the rules in various ways. We can maintain the concept of a decentralised ledger incrementally built up through chains of data blocks, whilst having

a different network of participants running software that gives them different rights within the system. For example, we might design a system where:

1. Financial professionals have public addresses, but are only able to receive tokens

2. Regulatory and civil society bodies have public addresses, but are able to *distribute* tokens

This could be used to set up a simple 'karma' system in which financial professionals can accrue both positive and negative tokens to their public addresses from designated partners in the network over time. A disciplinary action could get recorded as an influx of 'negative karma' tokens, whilst a positive action could get recorded as an influx of 'positive karma' tokens. Below are some steps that would be needed to make this happen.

Step 1: Blockchain addresses

Firstly, we need to find a way to give public addresses to each professional in order to identify them in the system. In the case of the UK, this will ideally occur when the professional qualifies for registry as an 'approved person' on the Financial Conduct Authority register, which allows them to perform 'controlled functions' such as dealing directly with customers. Currently, UK financial workers are only placed on the FCA register when they pass certain professional exams that show they are capable of working respon-

rager la responsabilité sociale des entreprises, des organisations non-gouvernementales telles que Oxfam pourraient être habilitées à envoyer des jetons positifs quand des actions positives ont lieu. Tous ces jetons seraient visibles publiquement et permettraient donc aux professionnels de mettre en avant leurs actions en faveur de la responsabilité sociale des entreprises.

Pour mettre en application un tel système plein de finesse, des instruments programmables comme Ethereum pourrait être utiles. Ils permettent la certification différentiée des partenaires du système ce qui leur donne des droits et des possibilités d'utiliser différents types de jetons.

L'apparition d'un flux de "karma" en provenance des divers acteurs sur les adresses des professionnels de la finance les encouragerait à cultiver leur bonne image publique en recherchant des "karma" positifs. Cela présente toutefois le risque de la corruption

sibly and independently. For lower level controlled functions, this occurs within about a year of starting in the industry.

Imagine a scenario then, in which a financial professional is designated with a public blockchain address that identifies them by name as soon as they are registered with the FCA[8].

Step 2: Sending 'professional recognition' tokens

A body like the FCA might be given special powers within the system to control a different class of public address that is able to send 'professional recognition' tokens to the addresses of financial professionals who have passed certain tests or exams. Thus, as a financial professional qualifies for inclusion on the FCA register, and is designated with a public address, they might also get an initial batch of professional recognition tokens sent to their address, publicly symbolising their competence. As they progress in their career and earn new qualifications, they can accrue more of these, perhaps from bodies like The Institute of Chartered Accountants in England and Wales (ICAEW).

Step 3: Sending disciplinary 'negative karma' tokens

Authorities like the FCA could also be given special powers – via the

8 As a technical point, customisable blockchain addresses have already been pioneered by services like VanityGen. See http://bitcoin-vanitygen.com/

coding of the system – to distribute 'negative karma' tokens to the public addresses of professionals who engage in financial misconduct such as misselling, unauthorised trading or market manipulation. There might be different categories of negative karma tokens, distributable by different authorities.

Step 4: Sending 'positive karma' tokens

Ideally, the system is designed to incentivise corporate social responsibility actions on the part of financial professionals. In order to do this, a network of civil society groups – such as environmental sustainability NGOs or human rights groups – are encouraged to join the network. They are given special powers via the coding of the system to distribute 'positive karma' tokens from their public addresses to the public addresses of professionals who undertake some form of positive task, for example volunteer work.

One might even conceivably subdivide these positive tokens into categories like 'sustainability tokens', issued by groups like Friends of the Earth, or tokens for youth mentoring, issued by groups like ReachOut.

These positive tokens can accrue, enabling a financial professional to showcase their corporate social responsibility actions. Furthermore, it enables a professional with a poor record to 'redeem' themselves, or seek salvation from previous negative actions by working up such points.

du système. Un professionnel pourrait ainsi être tenté d'acheter des "karma" positifs pour compenser des enregistrements négatifs. Ce risque pourrait être contenu, si l'attribution de jetons positifs exigeait des signatures multiples dans l'organisation concernée. Cela pourrait aussi limiter le "marché noir" des "karmas" positifs.

Le schéma proposé ici est obligatoire, mais il serait peut-être plus facile de démarrer avec des projets pilotes sur une base volontaire. Une institution financière pourrait ainsi mettre sur pied un système blockchain en partenariat avec un certain nombre d'acteurs de la société civile, ou bien les plus grande banques britanniques (Big 5) pourraient initier un tel projet entre elles.

Une autre alternative serait d'utiliser ce système pour enregistrer le comportement d'une entreprise plutôt que des professionnels individuels. Nous pourrions créer un système dans lequel les banques, par exemple

The technicalities

The concept sketched above would require more advanced coding and design than is currently found in the Bitcoin system. In the Bitcoin system, addresses can only receive a single type of token, and can both receive and send. To implement a more nuanced system like this, a more advanced programmable system like Ethereum[9] might be used, in which smart digital certificates might be issued to different players in the system, giving them different rights and abilities.

For example, imagine a type of coded instruction within the system saying: [*If participant has sustainability digital certificate*, then give rights to participant to attribute another address with *sustainability tokens*.].

The possible results, and problems

The result of this would be the creation of streams of incoming 'karma' tokens into a financial professional's address from different organisations over time. This in turn would build up a public picture that interested parties can browse if they so wish. This gives encouragement to the professional to cultivate a good public image by seeking to accrue positive karma and professional recognition points. On the other hand, the threat of public display of misconduct will help discourage negative behaviours.

An important feature of this sche-

9 See Wood (2014) for further technical details of the Ethereum system

me is the ability to 'redeem' oneself by seeking positive karma tokens that might 'offset' the negative ones. People make mistakes, and while a public record of misconduct might be valuable, it is also vital that the public record is not irredeemably marked against someone for all time.

The problem that emerges from this, however, is the risk of *corruption* in the system. A financial professional might bribe or attempt to buy positive karma tokens to offset a negative record. Indeed, a general problem in most points-based reputation systems is that people can learn how to 'game' them. Furthermore, such systems can sometimes be open to sabotage of reputation. Consider for example, EBay reviews, where sellers might pay people to give them good reviews, and might even conceivably attempt to sabotage the ratings of competing sellers.

To some extent this can be avoided by partnering only with established, stable and respected civil society partners – such as Oxfam – but there may also be ways of building safeguards into the design of the system itself. For example, *multi-party signature* ('multi-sig') systems might be used, in which a series of different people within an organisation are required to approve an allotment of karma tokens to a financial professional. This could prevent conflict-of-interest situations, such as a junior employee of an organisation with token-granting rights unilaterally deciding to give tokens to a former university friend who now works at a bank.

Goldman Sachs, auraient une adresse publique. Le FCA enverrait les jetons négatifs quand l'entreprise est sanctionnée, mais les collaborateurs individuels de Goldman Sachs seraient aussi incités à entreprendre des actions volontaires pour attirer des jetons positifs. Certains s'offusqueront du caractère utilitariste de cette proposition – qui permettrait aux entreprises de gagner de bons points pour compenser les mauvais – mais elle correspond à la manière dont les entreprises opèrent. Elles mobilisent d'importantes ressources dans les relations publiques pour neutraliser la publicité négative des scandales. Peut-être un système de karma-jetons pourrait-il forcer les grandes entreprises à montrer concrètement leur impact positif plutôt que d'utiliser leur pouvoir médiatique pour bluffer à ce sujet.

Il y a plusieurs raisons pour lesquelles la méthode blockchain pourrait avoir du succès. Les entreprises financières ont une vraie difficulté à main-

Mandatory schemes vs. voluntary schemes

In the proposal sketched above, it is mandatory for FCA registered financial professionals to join the system. Nevertheless, while it would be ideal to get regulatory bodies like the FCA (or the U.S. Securities and Exchange Commission) on board with an initiative like this, it may be easier to pave the way with simpler voluntary pilot programmes.

For example, a single financial institution might independently decide to implement a voluntary blockchain 'karma' system in partnership with select civil society groups, and use it as part of employee assessment. Employees can attempt to accrue positive karma points by actively engaging in the firm's CSR programme. The firm can display this record publicly as a part of a commitment to transparency.

More ambitious could be a voluntary effort on the part of the 'Big 5' UK banks to implement a joint pilot project, alongside a network of civil society stakeholders.

There are tricky issues that may conceivably arise when trying to include all registered financial professionals within a public reputation system. While some may welcome the opportunity to build up a public record of 'good karma', others may protest about issues like perceived privacy infringement.

One possible alternative option may be to set up a blockchain reputation system that records the con-

duct of *whole firms* rather than single financial professionals. It could use a similar structure to the individual scheme described above, but instead of individual financial professionals having public addresses on the system, firms will have addresses.

Implementation concept 2: A firm-level

Thus, as a member of the public I may be able to visit the public address page of Goldman Sachs and be able to see streams of positive and negative karma points coming in from different members of the network.

For example, the SEC may fine the firm for market misconduct and send them a large quantity of negative disciplinary tokens. But, on the other hand, individual Goldman Sachs employees may be undertaking positive volunteering programmes, so smaller streams of positive tokens can be viewed offsetting the negative ones.

One might take exception to the utilitarian moral framework set up, the idea that a firm can 'earn' positive moral points that somehow offset or override negative moral points. In reality, though, this is how the public discourse around financial institutions often takes shape anyway. Firms put large resources into showcasing their positive social and environmental image in order to neutralise the negative public image attracted by scandals and cases of market abuse.

Perhaps, setting up a decentralised system of karmic tokens will force large firms to concretely show

tenir la confiance du public. En utilisant une technologie de pointe open source qui promeut la démocratisation, elles seraient en mesure de casser leur image élitiste et fermée. En mettant sur pied une base de données participative avec le concours d'un réseau d'organisations de la société civile et de régulateurs, on pourrait changer la manière dont est perçue la surveillance financière. Sa perception deviendrait plus inclusive, et même amusante pour le public qui a souvent l'impression d'en être exclu. Les professionnels de la finance ont ici une opportunité de proposer une nouvelle approche de la réputation mobile, alors que la société civile recevrait un rôle proactif d'encouragement des bons comportements.

Toutefois, il faut aussi noter les limitations d'un tel schéma. L'inconduite en matière de finance, n'est pas toujours réductible à la distinction entre le bien et le mal au niveau des actions individuelles. Durant la crise de 2008, des grands dégâts ont été

their positive impact – in the form of incoming positive tokens – rather than using their media and public relations clout to bluff about it.

Why these schemes could prove successful

Blockchain reputation systems offer fascinating potential to build a transnational database of real time financial institution and financial professional reputation, crowdsourced via a global network of civil society groups, regulators and other parties. Such systems could conceivably even morph into a type of national or global voting system on the most ethical banks and funds.

Financial services firms currently have a real issues with maintaining public trust, and partaking in such a scheme would shows that they are committed to re-engaging with the public in a compelling way. By using an emergent cutting-edge technology of democratisation that is based on open source principles, they can break down the closed, elitist image normally associated with them.

It would also mark a departure from traditional systems of disciplinary action, in which professionals are pushed to feel accountable to their bosses and regulators, but not to the broader public. Setting up an interactive system that requires the participation of a diverse range of stakeholders will change the 'feel' of financial conduct monitoring, making it more inclusive and engaging to members of civil society who often feel shut out from such processes.

Financial professionals may in turn feel grateful for the opportunity to build a new form of portable reputation, and enjoy the emergent sense of accountability to parties beyond a faceless central regulator. It could form the basis for interesting new modes of political engagement between civil society groups and the financial sector, giving NGOs and others a proactive role in encouraging good behaviour, rather than a reactive one in attacking bad behaviour.

Finally, the system could just seem more *fun* than others we have in place right now, which is great for public engagement. Teenagers will not get excited about bland regulatory websites, but a 'crypto-karmic blockchain system' based on leading edge technology could stir up a great deal of interest, and be a spur to learning about the financial sector and its role in society.

It must be recognised that the act of publicly recording basic reputation is not going to solve the *deeper* problems of financial misconduct. The problem of poor financial ethics often cannot be reduced to 'good versus bad' deeds on the part of individuals.

Recognising the limitations

Rather, the issues are often structural, such as hierarchal fragmentation of responsibility within firms creating disconnected moral vacuums in which financial professionals do not feel directly responsible for the outcomes of actions they take part in.

Such a dynamic can be seen in the case of the 2008 financial crisis.

causés parce que des
employés individuels
des banques ne se sen-
taient pas personnelle-
ment responsables des
conséquences négatives
pour la collectivité.

Pour avancer sur ces
pistes, une étude de
faisabilité technique
doit être lancée. Cela
implique l'identifi-
cation préalable des
institutions finan-
cières, des institutions
régulatrices, des
représentants clé de
la société civile et des
partenaires informa-
tiques. La question
du financement doit
aussi être abordée. Les
sommes générées par
les amendes financières
pourraient être utile-
ment affectées, entre
autres, au déploiement
et au maintien d'un tel
système.

Ce nouveau projet est
en ligne avec l'esprit
du temps. Même s'il est
un défi du point de vue
technique, la mise au
point d'un projet pilote
permettra d'acquérir
l'expérience nécessaire
pour son évolution
future.

While there were overt cases of fraud, much of the damage occurred due to individual bank employees not feeling that they were individually responsible for the collective havoc that was being unleashed. A reputation system for recording personal behaviour can only go so far in challenging deeper management issues like that.

Moving forward with a pilot programme

To move forward, more research would need to go into the technical feasibility and precise details of this system. The basic steps to take are:

1. Identify financial institutions and regulatory partners to get on board

2. Commission a broader and deeper feasibility study

3. Identify software partners and platforms (such as Ethereum, Eris Industries, and Counterparty)

4. Work on the design, coding and technical implementation of the system

5. Identify key civil society stakeholders who may wish to participate in maintaining the network.

Finally, consideration would have to be put into the funding of this project. To some extent, a network like Bitcoin is *self-funding* because the tokens it moves around have come to have exchange value. Thus, the

network participants are incentivised to maintain the public ledger in exchange for fees and 'block rewards'. In the case of an alternative blockchain system where the tokens do not necessarily have monetary value, other funding systems may have to be implemented. For example, money obtained from financial fines may conceivably be used to support the deployment and maintenance of the system infrastructure.

Conclusion

This novel blockchain reputation scheme could prove popular at a time when financial institutions are looking to put resources into experimenting with blockchain technology whilst simultaneously needing to improve their public image and engagement. It captures the spirit of the times, and even if it proves to be technically challenging, the process of building a pilot will throw up valuable research questions and experience that can be incorporated into similar future projects.

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