

Digital Finance & the COVID-19 Crisis

Douglas W. Arner^{*}, Janos N. Barberis^{**}, Julia Walker^{***},
Ross P. Buckley^{****}, Andrew M. Dahdal^{*****} & Dirk A. Zetsche^{*****}

Revised: 16 April 2020

<https://ssrn.com/abstract=3558889>

Executive Summary

The COVID-19 coronavirus crisis is putting unprecedented strain on societies, markets, governments, businesses and individuals. The human, economic and financial costs are increasing dramatically, with potentially huge impact on all countries, with developing emerging market countries particularly exposed. Everywhere, the greatest toll is likely to fall on those least able to bear it, with terrible damage to human development across the world.

This paper examines how the digital financial infrastructure that emerged in the wake of the 2008 Global Financial Crisis is being and can be further leveraged to overcome the immediate challenges presented by the pandemic and manage the impending economic fallout. The origins of the 2008 crisis and current crisis are different: 2008 was a financial crisis spilling over into the real economy. 2020 is a health and geopolitical crisis, spilling over simultaneously into financial markets and the real economy. As such, this crisis requires different approaches.

This study operates at two levels:

- At the macro level, it seeks to identify areas of systemic risk and look at strategies and frameworks to support policy coordination and action; and
- At the micro level it seeks to illustrate how digital financial tools may be able to address some emerging challenges.

^{*} Kerry Holdings Professor in Law and Director, Asian Institute of International Financial Law, Faculty of Law, University of Hong Kong; Advisory Board Member, Centre for Finance, Technology and Education.

^{**} Head of Entrepreneurship & Academic Board Member, CFTE and a Senior Research Fellow & PhD Candidate at the University of Hong Kong.

^{***} Head of Government and Industry Affairs, Refinitiv.

^{****} KPMG Law and King & Wood Mallesons Chair of Disruptive Innovation, Scientia Professor, and Member, Centre for Law, Markets and Regulation, UNSW Sydney. Professor Buckley chairs the Digital Finance Advisory Panel of the Australian Securities and Investments Commission (ASIC) however the views expressed herein are strictly his own, not those of ASIC.

^{*****} Assistant Professor, College of Law, Qatar University. Centre for Law and Development. This Article was made possible by the NPRP award NPRP 11S-1119-170016 from the Qatar National Research Fund (a member of the Qatar Foundation).

^{*****} Professor of Law, ADA Chair in Financial Law (Inclusive Finance), Faculty of Law, Economics and Finance, University of Luxembourg; Director, Center for Business and Corporate Law, Heinrich-Heine-University.

The authors gratefully acknowledge the financial support provided by the Hong Kong Research Grants Council Research Impact Fund and the Qatar National Research Foundation Strategic Research Priorities Programme.

Strategies to address financial aspects of the crisis, in order to reduce the economic and human impacts, include: (1) ensuring sufficient liquidity to support market functioning and underpin demand; (2) intensifying information exchange and transparency on health *and* financial / economic matters in an effort to ensure accurate information; (3) heavy, temporary financial support for individuals and small, medium and large enterprises to avoid loss of infrastructure and preserve the capacity for an orchestrated response (by avoiding mass insolvency); and potentially, in some cases, for governments; (4) leveraging digital finance and payments to reduce human-to-human contact, while organizing support for the elderly and other digitally excluded people who would normally use physical channels; (5) establishing a well-funded coordination body as a crisis management tool to ensure information exchange; (6) directing financial resources to medical infrastructure; and (7) directing financial resources to digital infrastructure and connectivity to support all other aspects of society and the economy, including, especially, the online facilitation of education and widespread work-from-home policies.

At the same time, the digitization of financial services in the last decade offers alternative and more direct means by which it may be possible to stimulate the real economy, which will be critical in mitigating the economic impacts and maintaining social cohesion. Tools that support financial inclusion, sustainable development and achievement of the UN Sustainable Development Goals can also be highly useful in this crisis. Examples include: (1) electronic payments systems providing instant disbursement of financial resources; (2) online cash distributions to all consumers or businesses of a given country / region; (3) automatic data exchange on delivery chains and stocks of crucial supplies (through APIs, RegTech and distributed ledger technology) as well as related financial transfers; (4) realtime digital management of scarce medical goods according to a nationally, regionally and globally coordinated protocols (including pharmaceutical products, vaccines and protective equipment); (5) invoice factoring, blockchain and crowdfunding to collect resources and unlock trapped capital; (6) digital identification systems allowing for personal health monitoring and verification in addition to serving as the basis of financial infrastructure such as payments and accounts; and (7) furthering digital collective decision-making. These short-term strategies are expected to generate deeper structural changes long-term. For now, one cannot predict the new world that will emerge post crisis, but focused attention on these issues will remain critical going forward. The increase in data collection by digital means will also have consequences which will need to be explored.

Contents

<u>I.</u>	<u>Introduction</u>	3
<u>II.</u>	<u>Addressing financial sector issues: Interrelationships between finance and the real economy</u>	4
<u>III.</u>	<u>Economic impact: Maximizing digital channels</u>	6
<u>A.</u>	<u>Directed financial assistance</u>	7
<u>B.</u>	<u>Public programmes</u>	7
<u>1.</u>	<u>Digital Identity</u>	9
<u>2.</u>	<u>Behaviour Management</u>	9
<u>3.</u>	<u>Information Sharing</u>	10
<u>4.</u>	<u>Tokenization</u>	10
<u>IV.</u>	<u>Human Impact: Continuity mechanism in time of disruption</u>	11

<u>A.</u>	<u>Health Risk Management</u>	11
<u>B.</u>	<u>Insurance</u>	12
<u>C.</u>	<u>Contactless Payments</u>	13
<u>D.</u>	<u>Crowdfunding</u>	13
<u>E.</u>	<u>Digital currencies</u>	13
<u>F.</u>	<u>Remittance Services</u>	14
<u>G.</u>	<u>Personal Retirement Funding</u>	15
<u>V.</u>	<u>Risks of Technologies</u>	15
<u>VI.</u>	<u>Conclusion</u>	16

I. Introduction

The origins of the Global Financial Crisis of 2008 and the current COVID-19 crisis are very different and thus demand different responses and approaches: 2008 was a financial crisis spilling over into the real economy.¹ 2020 is a health and geopolitical crisis, spilling over simultaneously into financial markets and the real economy, with the possibility of financial spillovers in turn worsening the human and economic impacts in a vicious spiral.

The COVID-19 pandemic has shaken nations around the world. It has tested their healthcare infrastructure, battered their financial markets and left whole populations in fear and lockdown. This is a human health crisis first and foremost. The human crisis includes the economic and social consequences of the pandemic, and these secondary implications will be felt for years to come. Its impact has been devastating in Asia,² Europe³ and North America.⁴ Its potential impact on the developing world is even greater, given weaker healthcare systems and infrastructure,⁵ and the dependency on global trade given the function of many of these countries as natural resources producers or “global workbenches”, respectively.

While the most significant impact of the pandemic is human, the immediate consequences of individual quarantine measures and lockdowns are felt through supply chains (ie. reduced operation of factories and logistic networks), and increasingly and more severely through demand channels (ie. individual and business appetite for consumption, including consumption goods produced in developing countries, and prohibitions on certain services such as travel and hospitality) globally and locally.⁶ What is more, the level of uncertainties in terms of human casualties (COVID-19) and economic damage (the interaction between COVID-19 and economic activities around the world)⁷ is severely reducing trust within and between economic actors. The virus spreads within society, the loss of trust spreads within markets.⁸ In both cases, limitation of interaction, in the form of social distancing or reduced economic trade respectively, seems to be the short-term result. As the economic and human toll increases, so does the strain on the financial sector, which remains vital to direct financial resources to address the crisis and support recovery. Thus, while the impact is not focused on the financial

¹ Ross P Buckley and Douglas W Arner, *From Crisis to Crisis: The Global Financial System and Regulatory Failure* (London: Kluwer 2011).

² Motoko Rich, Hisako Ueno and Makiko Inoue, ‘Japan Declares Emergency as Experts Fear Tip of the Iceberg’, *The New York Times* (8 April 2020) <<https://www.nytimes.com/2020/04/07/world/asia/japan-coronavirus-emergency.html>>.

³ ‘Italy, Spain See Steady Drop in COVID-19 Infections as France Records Deadliest Day’, *SBS News* (8 April 2020) <<https://www.sbs.com.au/news/italy-spain-see-steady-drop-in-covid-19-infections-as-france-records-deadliest-day>>.

⁴ ‘Coronavirus: US Death Toll Passes 2,000 in a Single Day’, *BBC News* (11 April 2020) <<https://www.bbc.com/news/world-us-canada-52249963>>.

⁵ Natalie Whiting and Erin Handley, ‘The World’s Most Vulnerable Countries Could Become the Next Coronavirus Hotspots’, *ABC News* (1 April 2020) <<https://www.abc.net.au/news/2020-03-31/coronavirus-countries-infection-rates-most-vulnerable/12085816>>; ‘COVID-19: Urgent Action Needed to Counter Major Threat to Life in Conflict Zones’, *International Committee of the Red Cross* (30 March 2020) <icrc.org/en/document/covid-19-urgent-action-needed-counter-major-threat-life-conflict-zones>.

⁶ ‘COVID-19: Impact Could Cause Equivalent of 195 Million Job Losses, Says ILO Chief’, *UN News* (8 April 2020) <<https://news.un.org/en/story/2020/04/1061322>>.

⁷ Stanley Reed et al., ‘Oil Markets are a Mess. Can World Leaders Straighten them Out?’, *The New York Times* (9 April 2020) <<https://www.nytimes.com/2020/04/08/business/oil-markets.html>>.

⁸ Kylie-Anne Richards, ‘This Coronavirus Share Market Crash is Unlike those that Have Gone Before it’, *The Conversation* (16 March 2020) <<https://theconversation.com/this-coronavirus-share-market-crash-is-unlike-those-that-have-gone-before-it-133691>>.

sector, maintaining the robustness and effectiveness of the financial sector is central to the overall battle against COVID-19.

We examine here how the digital financial infrastructure that emerged in the wake of the 2008 Global Financial Crisis is being, and can be, leveraged to overcome the immediate challenges of the pandemic and manage the impending economic fallout. We explore some of the lessons arising from the use of digital financial platforms in the current crisis, including potential strategies and tools. Our examples underscore the versatility and agility of financial technology and demonstrate how the emerging digital financial infrastructure can be robust, resilient and most importantly responsive in the face of fluid and unpredictable events.

In this rapidly evolving and unprecedented context, digital financial innovations are being relied upon at both the micro and macro levels to overcome everything from basic logistical means of transacting,⁹ to the strategically important financial fundamentals¹⁰ – and everything in between. The primary measure taken to combat the spread of COVID-19, “social distancing”, will further embed digitization, ecommerce and financial technology into modern life. Beyond behavioural adaptation, widespread exposure to the cost savings, convenience and hygiene associated with digital finance will consolidate fintech usage more broadly, with potentially very important benefits for financial inclusion and sustainable development.¹¹ Thus far, the digital financial infrastructure has performed resiliently and responsively. The reliability and consistency of this digital lifeline, should it continue to work well, will transform fintech from an entrepreneurial novelty to an indispensable element of modern life.

II. Addressing financial sector issues: Interrelationships between finance and the real economy

From a financial sector standpoint, the starting point is to understand the situation and, from there, to deploy appropriate strategies to prevent or mitigate the financial crisis while minimizing damage to the real economy.

The 2008 Crisis originated with a financial crisis.¹² This in turn impacted the real economy (as financial resources became unavailable to support economic activity). This damage to the real economy in turn worsened financial sector issues (through both liquidity and solvency

⁹ Stephen Bartholomeusz, ‘The Coronavirus will Accelerate the Trend Towards a Cashless Society’, *The Sydney Morning Herald* (8 April 2020) <<https://www.smh.com.au/business/banking-and-finance/the-coronavirus-will-accelerate-the-trend-towards-a-cashless-society-20200408-p54i6u.html>>.

¹⁰ James Eyers and James Frost, ‘How the Coronavirus will Change Banking’, *The Australian Financial Review* (30 March 2020) <<https://www.afr.com/companies/financial-services/how-the-coronavirus-will-change-banking-20200330-p54fbo>>.

¹¹ Dirk A Zetsche, Ross P Buckley and Douglas W Arner, ‘FinTech for Financial Inclusion: Driving Sustainable Growth’, in Julia Walker, Alma Pekmezovic and Gordon Walker (eds), *Sustainable Development: Harnessing Business to Achieve the SDG’s through Finance, Technology and Law Reform* (Wiley, 2019) 179; Douglas W Arner, Ross P Buckley, Dirk A Zetsche and Robin Veidt, ‘Sustainability, FinTech and Financial Inclusion’ (2020) 21 *European Business Organisation Law Review* 7.

¹² The financial crisis began particularly in wholesale interbank markets resulting from loss of transparency, trust and confidence among major institutional players as a result of widely spread credit losses from securitization resulting in a liquidity and financial solvency crisis; see Buckley and Arner (n 1); Laura Chiamonte, *Bank Liquidity and the Global Financial Crisis* (Palgrave Macmillan, 2008, Cham), 1-2.

channels) causing a dangerous spiral (including spillovers to various governments around the world).¹³

In 2020, the triggering events are different. The situation appears to be primarily the result of two shocks. First, **a health crisis**: The COVID-19 coronavirus pandemic which started late in Q4 of 2019.¹⁴ Secondly, **a geopolitical crisis**: Oil price shocks, starting at the turn of 2020 and worsening towards end of Q1 2020.¹⁵

While the most significant impact of the pandemic is human, the immediate consequences of individual quarantine measures and lockdowns are felt through supply chains (ie. reduced operation of factories and logistic networks), and increasingly and more severely through demand channels (ie. reduced individual and business appetite for consumption, and prohibitions on certain services such as travel and hospitality services) globally and locally. Furthermore, uncertainties in terms of human casualties (COVID-19) and economic damage (COVID-19 and oil prices) are severely reducing trust within and between economic actors. The virus spreads within society. The loss of trust spreads within markets. In both cases, limitation of interaction, in the form of social distancing or reduced economic trade respectively, is the short-term result. These are also being expressed in potential loss of trust in the financial sector, as everyone seeks to maximize their access to cash¹⁶ – albeit so far mostly in digital form as opposed to physical cash or gold.

Unlike 2008, this crisis has not originated in the financial sector, but for the financial sector to operate efficiently it requires trust between actors and certainty in economic outlook. Both of these elements are now being challenged given the economic and human impact of this crisis.

Trust and certainty are the transmission mechanisms between the real economy and the financial markets. Companies, governments and individuals face potentially second order challenges, and these will in turn impact the financial sector. A weakened financial sector will not be able to perform well its role of financing the real economy, in turn worsening the business and human situation, and potentially thereby starting a vicious downward spiral.

Intervention to avert such an outcome needs to be targeted. We identify four levels of intervention, from Macro (infrastructure strain) to Micro (financial health).

The first level, from the standpoint of the financial sector, focuses on the infrastructure of the financial system, particularly payment systems and securities markets (for both companies and governments). One of the greatest concerns is failure in this core infrastructure, which is almost entirely digital. This digital plumbing lies at the core of any financial system, domestic or international.

To the extent this digital financial infrastructure functions as intended, it underpins the financial sector in performing its key functions of liquidity management and financial resource

¹³ Ross P Buckley, Emiliios Avgouleas and Douglas W Arner, 'Three Major Financial Crises: What Have We Learned?', in Douglas W Arner, Emiliios Avgouleas, Danny Busch and Steven Schwarcz (eds), *Systemic Risk in the Financial Sector: Ten Years after the Great Crash* (CIGI Press, 2019) 47.

¹⁴ 'Rolling Updates on Coronavirus Disease (COVID-19)', *World Health Organization* (Updated 9 April 2020) <<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen>>.

¹⁵ Jonathan Pearlman, 'The Geopolitics of COVID-19', *AFA Weekly* (18 March 2020) <<https://www.australianforeignaffairs.com/afaweekly/the-geopolitics-of-covid-19>>.

¹⁶ Jared Lynch, 'Cash is King as Dividends Ditched, Costs Slashed', *The Australian* (18 March 2020).

allocation, which are necessary to support economic activity and sustainable development.¹⁷ Authorities have hopefully placed considerable attention on these key areas under normal circumstances in terms of regulation, supervision and contingency planning.

Monitoring and ensuring crisis resilience of these core infrastructures is essential, as the damage of failure in times of crisis can be devastating. For instance, both medical and security personnel, and also core IT staff and tools, must be understood as crucial for the functioning of society and receive preferential medical treatment. At the same time, market behaviours highlight that it may be necessary in some circumstances to call trading halts or review trading halt trigger mechanisms. These however should be done ideally within present parameters (eg. in the case of stock exchanges) and for limited periods.

Cybersecurity is also a major source of operational risk and has recently become of greater concern.¹⁸ Before the pandemic cyber risk was seen as being greater than credit and financial risk, particularly as most firms struggled to deal with it. In the current situation where companies are rapidly moving staff from secure office or government networks to home networks, opportunities for potential breaches by malicious actors increase markedly as well as the risks of technical failures. We categorize these as TechRisks.

The second level, from the standpoint of liquidity, focuses on identifying where solvency problems in both the real economy (individuals, firms, governments) and the financial sector (bank runs, etc) will emerge.

At the heart of any financial sector are wholesale electronic systems which must be carefully monitored for stress by domestic liquidity providers (generally the central bank). In times of crisis, expansive credit lines from major central banks and assistance from international organizations can be essential. This is particularly true if consumers follow rumours on the crisis' impact on financial institutions and seek to withdraw cash, prompting a banking crisis on top of a health and economic crisis. A similar phenomenon is mirrored in the government sector where mass and rapid unemployment may result in "welfare runs" (as seen in Australia).¹⁹ Government welfare services can become quickly inundated by support seekers thus overstressing the capacity of the public service²⁰ and immediately skewing fiscal projections.

Yet liquidity supply alone will not ensure demand in the real economy if choice of goods remains limited (as it will likely be increasingly due to state intervention). Where choice of goods is limited, excess liquidity may well translate into higher prices for the few goods available. This may be where new (financial) products may help, discussed below in section III.A.4.

¹⁷ Zetsche, Buckley and Arner (n 11).

¹⁸ Ross P Buckley, Douglas W Arner, Dirk A Zetsche and Eriks Selga, 'TechRisk' (2020) *Singapore Journal of Legal Studies* 1.

¹⁹ 'If You Need a Payment – Coronavirus (COVID-19)', *Australian Government Services Australia* (Updated 9 April 2020) <<https://www.servicesaustralia.gov.au/individuals/subjects/affected-coronavirus-covid-19/if-you-need-payment-coronavirus-covid-19>>.

²⁰ Luke Henriques-Gomes, 'Newly Unemployed Australians Queue at Centrelink Offices as MyGov Website Crashes Again', *The Guardian* (24 March 2020) <<https://www.theguardian.com/australia-news/2020/mar/24/newly-unemployed-australians-queue-at-centrelink-offices-as-mygov-website-crashes-again>>.

The third level, from the standpoint of solvency of financial institutions, focuses on having closer to real-time reporting in order to coordinate timely responses. Batch reporting of financial data, for both listed and private companies, are retrospective and fail to capture dynamic financial changes. This pertains, for instance, to all annual, quarterly or monthly reports required by financial regulation. These numbers are outdated and fairly useless for steering an economy through a crisis.

RegTech and SupTech systems could provide important tools in this context. In the present crisis, concerns are not emanating from financial institutions but rather from the potential impact of the crisis on governments, firms and individuals and the potential knock-on impacts this may have on the financial sector. Given the very rapid change in economic conditions, systems for collecting and analysing data and its impact through RegTech and SupTech offer important tools as they provide more granular and real time information about financial health.²¹ Through the same infrastructure, if in place for longer periods, regulators could require significant institutions to report core data that could subsequently be used for economic projections and to model crisis impact scenarios.²² Regrettably, while RegTech and SupTech systems could provide vital tools in this respect, they unfortunately cannot be put in place quickly, and not in the context of a crisis such as this one.

The fourth level, from the standpoint of the financial health of individuals, businesses and governments, focuses on leveraging existing FinTech solutions. The increased reliance on grocery and food delivery services²³ has provided to be both a blessing and a curse. On the one hand, these services enable physical distancing and self-isolation, however when these food delivery systems fail, panic buying in physical supermarkets can prevail, and the delivery systems themselves, if poorly designed or implemented or if delivery staff seeks personal contact, can put workers at risk.²⁴ Communication through online learning, tutoring, education and marketing is increasing. This trend will likely continue and the financial resources needed to support growth in this technological infrastructure need to be directed to it.²⁵

Thus, at the first level is financial stability: financial stability from both the positive and negative standpoint, in that both financial crises need to be avoided if possible and minimized when they do occur (the negative side) and at the same time the financial system has to be able

²¹ Douglas W Arner, Janos Barberis and Ross P Buckley, *The RegTech Book* (Wiley 2019); idem., 'FinTech, RegTech and the Reconceptualisation of Financial Regulation' (2017) 37 *Northwestern Journal of International Law and Business* 371, 375 ('FinTech, RegTech and Reconceptualisation'); Luca Enriques, 'Financial Supervisors and Regtech: Four Roles and Four Challenges' (2017) 53 *Revue Trimestrielle de Droit Financier*.

²² Sylvia Shepperson, 'RegTech the Smart Future for Model Risk Management', *FinExtra* (21 June 2018) <<https://www.finextra.com/blogposting/15496/regtech---the-smart-future-for-model-risk-management>>.

²³ Marco Chiappetta, 'Uber Eats Demand Soars Due to COVID-19 Crisis', *Forbes* (25 March 2020) <<https://www.forbes.com/sites/marcochiappetta/2020/03/25/uber-eats-demand-soars-due-to-covid-19-crisis/#3fe5bd54580c>>; Mary Hanbury, 'UK Grocery Chains Add Hundreds of Thousands of Delivery Slots for Online Orders but Admit that They Can't Keep up with Demand', *Business Insider UK* (8 April 2020) <<https://www.businessinsider.com/tesco-ocado-sainsburys-cant-keep-up-with-surg-ing-demand-amid-coronavirus-4?r=AU&IR=T>>.

²⁴ Amien Essif, 'Pressure Mounts on Food Delivery Workers amid COVID-19' *Deutsche Welle* (23 March 2020) <<https://www.dw.com/en/pressure-mounts-on-food-delivery-workers-amid-covid-19/a-52848505>>; Alex Hern, 'Amazon Sales of 'Non-essentials' Hit by French Court Ruling', *The Guardian* (16 April 2020) <<https://www.theguardian.com/world/2020/apr/15/amazon-sales-non-essentials-french-court-ruling-union>>.

²⁵ Fergus Hunter and Jordan Baker, 'Uni Bosses Predict Permanent Shift to Online Learning but Not a 'Full-scale Revolution'', *The Sydney Morning Herald* (11 April 2020) <<https://www.smh.com.au/politics/federal/uni-bosses-predict-permanent-shift-to-online-learning-but-not-a-full-scale-revolution-20200410-p54iv7.html>>.

to function properly in order to achieve its core functions of supporting economic and other activities (the positive side).²⁶

III. Economic impact: Maximizing digital channels

Digital finance offers potentially important tools in directing resources quickly and efficiently to the stakeholders that need it the most. In particular we focus on the strategies and solutions available to mitigate economic and human impact.

In the present situation, economic impact results from short-term factors (but these could, at some point, turn into structural factors, which would in turn require different strategies). Digital financial tools are capable of achieving traditional crisis management objectives with greater potency and accuracy than was historically possible.²⁷ This may well be one advantage of governments in the current crisis which they did not have previously. The data-driven nature of digital finance provides policymakers with the ability to structure and scale stimulus with precision. The questions are whether the capability is sufficiently mature and whether the information is available, readable and in front of the decision makers. Consolidating, curating and monitoring collected information is a core pillar of crisis-readiness that may well be tragically revealed to be lacking in the current pandemic.

A. Directed financial assistance

In times of upheaval people need the means to secure the essentials of food, shelter and clothing. As long as basic market conditions still hold, and the situation has not deteriorated into riots and looting, commercial exchange will remain the only legitimate way to secure such essentials. Digital financial platforms, and digital wallets in particular, can deliver funds to those in need rapidly and accurately. One of the criticisms of banks in the current COVID-19 crisis in China has been their relatively slow response to ease the financial burden on virus victims.²⁸

Although several banks in the Chinese market²⁹ have responded to the crisis with measures such as mortgage relief, credit card payment holidays and corporate loan readjustments, they have been criticized for taking too long to act. In many developed nations, it has taken much longer for banks to react – and they have done so only after the government has taken the lead.³⁰ The timeframe for these relief measures have been in the “weeks and months” since the virus was first discovered. China’s big-tech companies, Alibaba and Tencent, have accustomed

²⁶ Douglas W Arner, *Financial Stability, Economic Growth and the Role of Law* (Cambridge University Press 2007).

²⁷ Douglas W Arner, Janos Barberis and Ross P Buckley, ‘The Evolution of FinTech: A New Post-Crisis Paradigm?’ (2016) 47(4) *Georgetown Journal of International Law* 1271 (‘Evolution of FinTech’).

²⁸ Val Law, ‘Big Tech Beat Banks in COVID-19 Response’, *Finews* (25 February 2020) <<https://www.finews.asia/finance/31047-big-techs-corona-crisis-covid19-hong-kong-china-singapore-response-fintech-alibaba-boc-hsbc-stanchart-axa?start=1>>.

²⁹ Chad Bray and Enoch Yiu, ‘Hong Kong Banks to Offer Relief on Mortgages, Credit Cards, Corporate Loans as Coronavirus Outbreak Weighs on Economy’, *South China Morning Post* (6 February 2020).

³⁰ David Taylor, ‘The Big Four Banks are Letting Borrowers Hit Pause on their Payments, But This is No Mortgage Holiday’, *ABC News* (21 March 2020) <<https://www.abc.net.au/news/2020-03-21/mortgage-pause-coronavirus-nab-commonwealth-anz-westpac/12076690>>.

the Chinese public to rapid and customized service in nearly all realms of digital life.³¹ We now live in a world of on-demand entertainment and Amazon Prime timeframes.³² In the era of instantaneous tech, this response time of banks appears to many to be too slow.

As noted by Finews.asia:

As more technology companies gain digital banking licenses, banks can no longer operate as they used to. They also cannot claim to be the source of vital 'life-lines' for their customers, if they do not demonstrate the timeliness of actions during critical times. If incumbent banks want to have a place in their clients' hearts, they must respond in the way that big techs do, and see themselves as part of the ecosystems they serve.³³

B. Public programmes

Many governments around the world have announced direct government stimulus packages to limit broad economic hardship and avert a sharp economic downturn. Some of these programs, such as Australia's "JobKeeper" program are premised on granular information that is to be cross referenced with other data points.³⁴ Most policymakers believe the pandemic will result in a broad economic tsunami rather than disruption in only certain limited sectors (ie. travel, hospitality). Many of the initiatives announced include those seeking to ensure sufficient liquidity to support markets, instill business and consumer confidence (or at least allay fear) and stimulate demand.

In addressing economic impact, the starting point is to identify market constraints and those groups most likely to be impacted. Effective policies and public programmes require sufficient calibration to target supply side obstacles in the provision of those essential needs that underpin social cohesion (food security, hygiene and medical supplies), in unison with stimulating aggregate demand. These targeted measures will seek to address issues relating to liquidity (temporary loss of income, business etc) and solvency.

At this stage, impact is widespread across individuals, SMEs, larger firms and public institutions (such as hospitals).³⁵ Impact on governments and the financial sector is so far

³¹ Zetsche, Buckley and Arner (n 11) 191-192.

³² Brian Solis, 'Impatience is a Virtue: How the On-demand Economy is Making Mobile Consumers Impatient', *Forbes* (20 November 2017) <<https://www.forbes.com/sites/briansolis/2017/11/20/impatience-is-a-virtue-how-the-on-demand-economy-is-making-mobile-consumers-impatient/#135bde70344c>>.

³³ Law (n 28).

³⁴ Such as: (1) How an employee has been in their position (must be at least 1 year); (2) turnover thresholds of employers (under or over \$1 billion); (3) Percentage of business downturn since 1 March 2020 (under \$1 billion must be at least 30% downturn in turnover and over \$1 billion – 50% downturn. See <<https://www.business.gov.au/risk-management/emergency-management/coronavirus-information-and-support-for-business/jobkeeper-payment>>.

³⁵ Michaela Boland, 'Coronavirus Has Shut Down Australia's Arts Industry but Artists Say the Government Has Ignored Them', *ABC News* (8 April 2020) <<https://www.abc.net.au/news/2020-04-08/arts-sector-say-need-emergency-funding-to-survive-shutdown/12130398>>; James Frost, 'SME Loan Guarantee Will Not Save All', *The Australian Financial Review* (30 March 2020) <<https://www.afr.com/companies/financial-services/the-sme-loan-guarantee-won-t-save-everyone-20200327-p54eha>>; Edmund Tadros, 'PwC to Cut Staff Hours and Pay by up to 40pc', *The Australian Financial Review* (6 April 2020) <<https://www.afr.com/companies/professional-services/pwc-to-cut-staff-hours-pay-by-up-to-40pc-20200406-p54hhw>>; 'A Look at the Hospitals Battling

limited but can be expected to increase in both cases dramatically the longer the crisis continues as tax revenues, in particular, fall precipitately.

In addition to mechanisms for monitoring financial and economic conditions, digital finance offers the potential to directly target financial resources rapidly to those experiencing the greatest impact. A combination of digital identity frameworks combined with widespread availability of financial and mobile money accounts provides the greatest potential for delivering resources directly to consumers.³⁶ In countries where such systems have been put in place, they should provide the foundations for the design of appropriate programmes and delivery of financial resources using algorithms prioritizing different factors such as age, health, social commitment, professional qualifications, and others. For the time being, at least, it appears the politics surrounding these types of social programs and assessments is less polarized than would normally be the case and more conciliatory.

Governments, NGOs and international organizations should seek to work with payment, financial and telecommunications providers to use whatever resources are available in terms of rapid targeted delivery. Cheques mailed over a period of months are really unlikely to have the desired level of effectiveness.

The table below sets out a sample of digital tools available in various countries, how they may be relevant and who they could be used to assist.

Tools & Examples			
<i>Tools</i>	<i>Example</i>	<i>Relevance</i>	<i>Beneficiary</i>
Digital Identity	Aadhar	Identification of individual health status	Gov / Public
Transfer	e-Tunai Rakyat	Instant disbursement of fund to beneficiary in closed loop	Public / SME
Peer-to-Peer	Lending Club	Direct lending origination & ROI above central banks	SME / Public
Crowdfunding	GoFundMe KickStarter	Pre-finance products using public support	SME / Public
Invoice factoring	Funding Society	Unlocking future income to limit liquidity issues	SME
AML / KYC	Comply	Scalable identification of	NGO

Coronavirus Around the Globe', *ABC News* (3 April 2020) <<https://www.abc.net.au/news/2020-04-03/look-at-the-hospitals-around-globe-coronavirus-covid-19/12117594>>.

³⁶ Douglas W Arner, Ross P Buckley and Dirk A Zetsche, *FinTech for Financial Inclusion: A Framework for Digital Financial Transformation*, Special Report, Alliance for Financial Inclusion / Group of 24 (Sep. 2018); Douglas W Arner, Dirk A Zetsche, Ross P Buckley and Janos P Barberis, 'The Identity Challenge in Finance: From Analogue Identity to Digitized Identification to Digital KYC Utilities' (2019) 20 *European Business Organisation Law Review* 55.

	Advantage	source of fund of micro-donation	
InsurTech	Ping An	Shorter reimbursement of cost to provider / claimant	Public / Hospitals
Sharing economy	Uber / Grab / Gojek	Mobilized under-utilized assets & co-ordinate resources	Gov / SME

For SMEs short term tools include the capacity to unlock future income by looking at invoice factoring solutions. However, this requires digitization of invoices, which might not be commonplace in developing markets. Moreover, in developed countries, many businesses have lost all future income due to the cessation of client orders.³⁷ Another tech approach heavily reliant on current and accurate information includes strategic cash injections aimed at businesses to avoid mass unemployment, loss of infrastructure and deterioration of workforce skills thus preserving readiness for a rapid kickstart as the health crises passes. For instance, states could rely on tax authorities to trigger reverse transactions based on the last VAT, corporate tax and income / salary tax records. Certain types of businesses may also be suitable for crowdfunding (see below). Governments which have at various times limited the use of crowdfunding platforms in their jurisdictions, could support suitable campaigns by declaring officially their conditional regulatory blessing.

1. Digital identity

Digitally identifying people will continue to grow in importance via connectivity to official repositories of identity data. This can provide the means for governments to pursue and implement remedial policies particular in the context of direct fiscal assistance. The financial crisis of 2008 saw substantial resources in some jurisdictions wasted through the misallocation of stimulus payments to deceased or non-existent citizens.³⁸ Digital identity verification and authentication should ensure that only intended recipients receive stimulus payments. The threat of fraud and identity theft can be greatly minimized through the strengthening and support of digital identity infrastructure.³⁹ It is important to note however, that authentication and verification of an identity via a digital channel should be the focus, not in creating separate “digital identities” or avatars.

2. Behaviour management

The uncharacteristic grocery store panics that have swept many developed economies are in many cases products of the digital dissemination of information. The issue of ‘fake news’ and popular misinformation through social media has been an issue of international significance for several years.⁴⁰ The overlap between social media and digital finance has been growing with services such as WhatsApp Pay and WeChat Pay emerging as extensions of popular messaging platforms. As these payment platforms develop further and become more widely

³⁷ Nassim Khadem, ‘Coronavirus Hit Almost Half of Australian Businesses Even Before Social Distancing, ABS Reveals’, *ABC News* (26 March 2020) <<https://www.abc.net.au/news/2020-03-26/coronavirus-economic-impact-in-australia-abs/12092488>>.

³⁸ Bonnie Malkin, ‘Thousands of Dead Australians get \$900 Stimulus Cheques’, *The Telegraph* (28 May 2009).

³⁹ See sources cited n 37.

⁴⁰ Kalinga Seneviratne, *Myth of ‘Free Media’ and Fake News in the Post-Truth Era* (Sage, 2020, India), 232-233.

adopted, this overlap creates an opportunity for the correlation of message dissemination patterns with purchasing behaviour potentially signaling early stage panic shopping and even pinpointing the products the panic focus upon (hand sanitizer, toilet paper, pasta etc).⁴¹

The social distancing and quarantine policies that have been adopted in many parts of the world have also seen a massive increase in e-commerce. The use of digital platforms to shop, pay and organize delivery of all types of goods has grown exponentially in Q1 2020,⁴² and is increasing further in Q2. Depending on how long these policies remain in place, and how well the delivery services work, they will evoke behavioural and purchasing pattern change. A 2010 University College of London university study focusing on human psychology concluded that it takes 66 days to create a habit.⁴³ What begins as a temporary lifestyle change, can, given enough time, become a new daily norm. As digital finance platforms take a more prominent role in people's lives throughout this crisis – some of these behavioural changes will stick.

Digital purchasing platforms are being used to limit the freedom of shoppers to bulk buy through implementing quantity quotas. The growth in and sophistication of app-based and online budgeting tools has seen the potential of identifying and categorizing financial transactions improve remarkably in recent years. Open banking platforms that provide third parties with customer banking information could also be leveraged to identify purchase behaviour, and aggregate data for panic identification and quota implementation. As Artificial Intelligence (AI) analytics develop, such sources of information can be easily correlated with other data sets (such as, for example, social media communications) to provide even more specific measures of public sentiment.⁴⁴

The sweeping use of behaviour management in the form of lockdowns, movement freedoms and mask wearing imposed by governments may continue for longer than strictly necessary. If the population do not believe in the rationale of the behavior management protocols, as seen in many parts of the world, a backlash can occur. Therefore behaviour management needs to be done in an open and transparent way where the population understands and acknowledges its rationale.

3. Information sharing

Information and trusted data are the life blood of the digital economy. From advertising to public health to detection of criminal activities, being able to access and use information is critical. As with war, in the midst of a crisis (especially this crisis), factual information can mean life or death. Establishing a well-funded, national coordinating body – such as a Health Stability Board – as a crisis management tool could ensure timely information exchange – especially between the public and private sectors. Emergency government powers may be used to overcome data privacy and protection obstacles and intensify information exchange on

⁴¹ Kiran Parashar, 'WhatsApp Forward Causes Panic Buying in Bengaluru', *The Times of India* (11 April 2020) <<https://timesofindia.indiatimes.com/city/bengaluru/whatsapp-forward-causes-panic-buying-in-bengaluru/articleshow/75089988.cms>>.

⁴² Stephanie Crets, 'How the Coronavirus is Affecting Online Retailers', *Digital Commerce 360* (12 March 2020) <<https://www.digitalcommerce360.com/2020/03/12/coronavirus-affects-online-retailers/>>.

⁴³ Philippa Lally et al, 'How Habits are Formed: Modelling Habit Formation in the Real World' (2010) 40 *European Journal of Social Psychology* 998.

⁴⁴ Dirk A Zetsche, Ross P Buckley, Douglas W Arner and Janos Barberis, 'From FinTech to TechFin: The Regulatory Challenges of Data-Driven Finance' (2018) 14(2) *New York University Journal of Law & Business* 393 ('From FinTech to TechFin').

health *and* financial / economic matters. Principles of Data Sharing and broader digital governance of information should be established.

The wisdom of crowds is perhaps most apparent in the context of mass consumer behaviour. The purchasing behaviour of the consuming public provides real-time indications of trends and fashions and can, as readily, highlight public consternation and full-blown panics. Using digital financing tools to aggregate purchase information (of medical supplies, for example, or toilet paper) can help identify emerging panics.

On a more practical level, various online communities around the world have begun to organically co-ordinate and crowdsource information in order to help efficiently design, manufacture and distribute medical supplies where they are needed most.⁴⁵ These groups include engineers, chemists, logistics expert and many other professionals as discussions and ideas are moderated and filtered through various socially co-ordinated channels.

4. Collective decision-making

Corporate decisions often depend on collective decision-making by boards and general meetings of shareholders. This could, among other things, relate to the disbursement of dividends, share buy-backs or recapitalization.⁴⁶ Keeping the economy afloat will require substitutes for in-person meetings. This is why many Parliaments around the globe have provided for digital, instead of in-person, meetings in corporate governance. In particular, most advanced economies, by way of crisis legislation, have allowed for some type of remote voting and/or virtual shareholder meetings.⁴⁷

5. Tokenization

Liquidity supply alone will not ensure demand in the real economy if choice of goods remains limited (as it will likely be increasingly due to state intervention). Where choice of goods is limited excess liquidity will likely translate into higher prices for the few goods available. Where real goods are limited, digitally created financial goods (by way of token offerings) or new digital services (eg. entertainment and news) could partially consume the excess liquidity in an orderly manner,⁴⁸ but mis-selling and fraud will be likely. However, tokens, online banking and mobile money schemes could also be used to channel funds faster to consumers to provide financial support and to support economic activity.

IV. Human impact: Continuity mechanism in time of disruption

⁴⁵ James Crowley, 'The Futuristic Solutions the Internet is Crowdsourcing to Cure Coronavirus', *Newsweek* (18 March 2020).

⁴⁶ Dirk A Zetzsche, Linn Anker-Sorensen, Roberta Consiglio and Miko Yeboah-Smith, 'The COVID-19-Crisis and Company Law - Towards Virtual Shareholder Meetings' (Working Paper, University of Luxembourg, 15 April 2020) V <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3576707>.

⁴⁷ Ibid III.

⁴⁸ Lewis Cohen and Andreas Freund, *Blockchain in Public Goods Allocation: Unlocking Economic Value and Equitable Distribution through Token-Based Markets* (Consensys White Paper) <<https://cdn2.hubspot.net/hubfs/4795067/ConsensSys-Blockchain-in-Public-Good-Allocation-White-Paper-Master.pdf>>.

Digital finance is not core to addressing health and human impact in a pandemic. It does however play a central role in addressing financial and economic impact and can also provide important tools to support health and human impact strategies and policies.

A. Health risk management

In particular, digital finance provides tools for monitoring potential epidemic outbreaks. It also provides mechanisms to direct financial resources to individuals, health care providers and others which are necessary for them to discharge their functions and provides other potential mechanisms to finance responses, particularly in developing countries but also in other contexts.⁴⁹

Telecoms and search data in particular can be valuable. Beyond this, the ability to deliver medical services and advice remotely (“telemedicine”) relates directly to the availability of communications infrastructure (particularly internet and mobile but also fixed line) and of electronic payment mechanisms, from the government, individuals, businesses, etc.

And, of course, e-tokens could be used for disseminating scarce goods to those with the greatest needs.

From the standpoint of social distancing, e-commerce is vital. So far, this has been widely available in the countries worst hit by this crisis, but will be far less common in developing countries going forward. Even where e-commerce is present, it will be crucial to use technology for facilitating delivery over the last mile to avoid human contact between delivery service provider and recipient. Examples of the range of initiatives are set out in the table below.

Tools & Examples			
<i>Tools</i>	<i>Example</i>	<i>Relevance</i>	<i>Beneficiary</i>
E-Commerce	Amazon Prime	Provide logistic delivery network for deployment of material	Public / SME
HealthTech	Babylon	Tele-medicine in order to evaluate individual situation	Public / Hospitals
EdTech	Edx	SME digitization to access FinTech services	SME
Alternative Data	Klarna	Re-evaluate credit scoring methods with dynamic sources	Public / SME
Gig Economy	Deliveroo	Leverage on mobile workforce to reach isolated people	Public

⁴⁹ Zetzsche, Buckley and Arner (n 11).

WealthTech	Trezeo	Smoothen irregular income with investment product	Public
Mobile Phones	DemystData	Mapping of individual movement to estimate cluster spread	Public / Hospitals
ISP	RTR (AT)	Adjust bandwidth-cap to maintain service connectivity	Gov / SME

During this crisis, governments could look to digital identity for a dynamic understanding of the financial and personal health of individuals. In particular, as individuals recover health-wise, it becomes increasingly important to redirect our focus back to the economic crisis. We could also consider alternative technological approaches for monitoring. For instance, all people who have developed immunity could be assigned a personalized token with key health and qualification data that comes with a greater degree of personal freedom.⁵⁰ Wherever the priority lies and depending on the need, the token holder may be enabled or required to assist elderly and persons at risk and/or perform crucial economic and production functions. Through the token, the respective priorities could be adjusted short term, taking into account the region, qualifications and social commitments of the token holders.

B. Insurance

The availability of insurance (medical, travel, pet) via online platforms has grown of late.⁵¹ As COVID-19 has spread, the demand for insurance has also increased. Notably, however, the declaration of COVID-19 as a pandemic rendered many existing travel insurance policies ineffectual and left many others in grey areas in relation to claims.⁵² A significant volume of insurance disputes arising from the COVID-19 situation are therefore to be expected.

In order to alleviate distress and simplify the resolution of insurance-related financial disputes, online dispute resolution services such as the private UK service ‘Resolver’⁵³ – as well as other public and private online dispute resolution platforms may have a vital role in the recovery process (particularly in light of emerging and likely ongoing social distancing guidelines).

Attaining insurance through digital platforms has never been easier. The responsiveness of InsurTech platforms to the epidemic has been most visible in China especially with *WeSure* (the insurance arm of Chinese tech giant Tencent). *WeSure* has rapidly launched a suite of

⁵⁰ Paul Mozur, Raymond Zhong and Aaron Krolik, ‘In Coronavirus Fight, China Gives Citizens a Color Code, with Red Flags’, *The New York Times* (1 March 2020) <<https://www.nytimes.com/2020/03/01/business/china-coronavirus-surveillance.html>>; Heather Murphy, ‘14 Days with a Quarantine Tracker Wristband: Does it Even Work?’, *The New York Times* (8 April 2020) <<https://www.nytimes.com/2020/04/08/world/asia/hong-kong-coronavirus-quarantine-wristband.html>>.

⁵¹ Sabine Gebert-Persson et al, ‘Online Insurance Claims : When More than Trust Matters’ (2019) 37(2) *International Journal of Bank Marketing* 579, 580.

⁵² Anna Tims, ‘Coronavirus: Travel Insurance Policies Not Paying Out in a Crisis’ *The Guardian* (31 March 2020) <<https://www.theguardian.com/money/2020/mar/31/coronavirus-travel-insurance-policies-not-paying-out-in-a-crisis>>; Pat McGrath, ‘TAL Drops Plans for Coronavirus Exclusion Clause on Life Insurance’ *ABC News* (8 April 2020) <<https://www.abc.net.au/news/2020-04-08/tal-backflips-coronavirus-exclusion-clauses-for-life-insurance/12130484>>.

⁵³ Detailed information on services ‘Resolver’ offers is available at: <<https://www.resolver.co.uk/complaints/insurance-complaints>>.

insurance products⁵⁴ aimed at protecting potential Corona Virus victims (covering a wide scope of potential policyholders from medical personnel to SMEs). *Xiang Hu Bao*, a Chinese mutual aid platform (backed by Ant Financial) has even piloted the use of blockchain data verification to fast track payments to virus victims and avoid face-to-face transactions.⁵⁵

WeSure has even launched a free insurance policy,⁵⁶ open to all Chinese citizens aged 0-65 as part of its corporate social responsibility obligations to further support the Chinese people and the fight against the virus. Beyond being a shrewd financial move, this has clearly communicated the message that “you are safe in our eco-system” - blurring the lines between the real and virtual worlds in a way sure to favour BigTech organizations.

C. Contactless payments

The norms of social interaction are shifting due to concerns over the spread of the virus. People across the world have been instructed to minimize physical contact in the course of their everyday lives in order to slow its spread. Digital wallets supporting contactless payment and other forms of contactless transacting are proving to be more convenient and faster than traditional cash or card transactions, and more hygienic.⁵⁷ The decades-old drive towards a cashless society now has an even more compelling driver. This is a field ripe for further, and ongoing, behavioural change.

D. Crowdfunding

Crowdfunding initiatives (and their supporting platforms)⁵⁸ are emerging as vital decentralized lifelines⁵⁹ in times when the capabilities of centralized governmental control are being severely tested. Members of the public who might otherwise feel powerless in the face of the virus, have committed millions of dollars to COVID-19-related crowd-funded causes – these include everything from a high profile crowd funding campaign launched by football superstar Zlatan Ibrahimović,⁶⁰ to less high-profile causes regarding people facing economic hardship due to virus-related job loss. Even the Centre for Disease Control (CDC) has turned to crowdfunding,⁶¹ whilst a GoFundMe page for the San Raffaele hospital in Milan has so far

⁵⁴ ‘WeSure Launches Novel Coronavirus Pneumonia Insurance Covering 15 Million People against Outbreak of Covid-19’, *PRNewswire* (15 February 2020) <<https://www.finanzen.ch/nachrichten/aktien/wesure-launches-novel-coronavirus-pneumonia-insurance-covering-15-million-people-against-outbreak-of-covid-19-1028907657>>.

⁵⁵ Georgina Lee, ‘Insurance Service Providers Rely on Blockchain to Fast Track Claims Payout amid Coronavirus Outbreak’, *South China Morning Post* (9 February 2020).

⁵⁶ Charlie Wood, ‘Free Coronavirus Cover Offered by Insurtech WeSure’, *Reinsurance News* (17 February 2020) <<https://www.reinsurancene.ws/free-coronavirus-cover-offered-by-insurtech-wesure/>>.

⁵⁷ Although the risks of viral transmission by the handling of cash have at times been overstated, see Raphael Auer, Giulio Cornelli and Jon Frost, ‘Covid-19, Cash and the Future of Payments’ (BIS Bulletin, 3 April 2020) <<https://www.bis.org/publ/bisbull03.htm>>.

⁵⁸ John Armour and Luca Enriques, ‘The Promise and Perils of Crowdfunding: Between Corporate Finance and Consumer Contracts’ (2018) 81(1) *Modern Law Review* 51; Dirk Zetzsche and Christina Preiner, ‘Cross-border Crowdfunding: Towards a Single Crowdlending and Crowdinvesting Market for Europe’ (2018) 19(2) *European Business Organization Law Review* 217.

⁵⁹ Nicholas Kulish, “‘People Need Immediate Relief,’ and Online Donors Make it Happen”, *The New York Times* (16 March 2020).

⁶⁰ The campaign initiated by this soccer star can be found at <<https://www.gofundme.com/f/kick-the-virus-away>>.

⁶¹ ‘CDC Foundation Launches Crowdfunding Campaign to Extend and Accelerate Public Health Coronavirus Response’, *CDC Foundation* (12 March 2020) <<https://www.cdcfoundation.org/pr/2020/cdc-foundation-launches-coronavirus-covid19-crowdfunding-campaign-charidy>>.

raised over 4 million Euros.⁶² Leading Ethereum crowdfunding platform GitHub has also announced it will have a public health focused funding round.⁶³

Although start-up funding via crowdfunding platforms will diminish due to the virus,⁶⁴ the platforms themselves are proving useful and versatile. The case can even be made that crowdfunding is in fact helping the fight against corona virus through its ability to financially support, for example, frontline medical staff who have contracted the virus and been forced into self-isolation without pay.⁶⁵

In this global crisis in a globalized world, crowdfunding is connecting urban populations to their local businesses, parks,⁶⁶ entertainment venues, and sports clubs strengthening community bonds that in recent decades may have frayed. Major tech players are using their platforms to support this organic outpouring of community support underscoring an important dimension to digital finance.⁶⁷

Digital financial platforms, so synonymous with global capital and transnational finance, are in some ways having grassroots impact and rebuilding social community bonds in a context where faith in globalization is being tested. Digital token offerings are playing into this broader trend as individuals are able to use such technologies to invest in crowdfunding initiatives within their local or regional communities and economies demonstrating much needed solidarity.

E. Digital currencies

The decentralized nature of many cryptocurrencies can mitigate the danger of operational disruption due to a severe outbreak in a particular area. The advantages of a decentralised operational structure could come very much to the fore in this context.⁶⁸ However, this has not stopped the price of Bitcoin, the most well-known cryptocurrency, from being highly volatile, belying its digital “safe haven” reputation.⁶⁹

⁶² See <<https://www.gofundme.com/f/coronavirus-terapia-intensiva>> (Last accessed on 3 April 2020).

⁶³ Mike Dalton, ‘Ethereum’s Largest Crowdfunding Platform to Combat Coronavirus with Grants’, *CryptoBriefing* (14 March 2020) <<https://cryptobriefing.com/ethereums-biggest-crowdfunding-platform-combat-coronavirus-grants/>>.

⁶⁴ JD Alois, ‘Startup Funding Predicted to Take Coronavirus Induced Hit in Q1’, *Crowdfund Insider* (17 March 2020) <<https://www.crowdfundinsider.com/2020/03/158929-startup-funding-predicted-to-take-coronavirus-induced-hit-in-q1/>>.

⁶⁵ Sally Murrer, ‘Milton Keynes Hospital Staff Forced to Self-isolate due to Coronavirus get Crowdfunding Help’, *MkCitizen* (16 March 2020) <<https://www.miltonkeynes.co.uk/health/coronavirus/milton-keynes-hospital-staff-forced-self-isolate-due-coronavirus-get-crowdfunding-help-2451923>>.

⁶⁶ Mark Taylor, ‘Crowdfunding Effort to Support Milton Country Park’, *Cambridge Independent* (14 April 2020) <<https://www.cambridgeindependent.co.uk/news/crowdfunding-effort-to-support-milton-country-park-9106269/>>.

⁶⁷ Cromwell Schubarth, ‘Yelp, Intuit Pitch in with GoFundMe to Help Small Businesses Hurt by COVID-19’, *Silicon Valley Business Journal* (24 March 2020) <<https://www.bizjournals.com/sanjose/news/2020/03/24/yelp-pitches-in-to-help-on-small-businesses-hurt.html>>.

⁶⁸ Hossein Nabilou, ‘Bitcoin Governance as Decentralised Financial Market Infrastructure’ (16 March 2020) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3555042>.

⁶⁹ ‘Bitcoin’s Coronavirus Crash; Blockchain in a Pandemic’, *Forbes* (15 March 2020) <<https://www.forbes.com/sites/cryptoconfidential/2020/03/15/bitcoins-coronavirus-crash-blockchain-in-a-pandemic/#5862f9bf2a5b>>. But see also, Billy Bambrough, ‘Bitcoin’s Next Boom has Already Begun’, *Forbes* (10 April 2020) <<https://www.forbes.com/sites/billybambrough/2020/04/10/bitcoins-next-boom-has-already-begun/#1ddee1105c64>>.

Certainly one of the more controversial innovations where digital finance and the COVID-19 crisis overlap has been the development of the so-called “CoronaCoin”⁷⁰ crypto-currency announced in early February. The idea behind the token is that the supply of the coin will diminish every 2 days at a rate connected with the fatalities caused by the virus. This will push up the price of the coin, rewarding investors with a return. The total supply of tokens is based on the global population and 20% of proceeds will be donated to the Red Cross. What utility the coin provides, or where the coin can be used remains unclear and many (including Forbes magazine) have labelled the cryptocurrency a macabre gimmick.⁷¹ Since its launch the coin has lost 83 per cent of its value and had no noticeable impact.

As noted by the developers of *CoronaCoin*, however, the idea of a cryptocurrency where virus or diseases are an underlying asset-condition, is not dissimilar to the World Bank’s 2017 “Pandemic Bonds”⁷² which were designed to help developing nations facing infectious disease outbreaks (but which are currently being offloaded by investors⁷³ and have never, even now, paid out).⁷⁴

A more recent cryptocurrency innovation (launched April 2) that has been inspired by the COVID-19 pandemic is a “Corona Fund Index Cryptocurrency” (CFIX). CFIX describes itself as inversely correlated to the S&P 500 through “the backing of an inverse-exchange-traded fund (ETF)”.⁷⁵ On its website CFIX states:

The Corona Fund Index Cryptocurrency is a HashCash charitable initiative to combat the COVID-19 pandemic crisis.

HashCash is raising funds to help all those affected by the novel coronavirus across geographies and provide financial aid to nonprofits and research organizations. The goal is to prevent the depletion of resources required for the development of advanced treatments, vaccines, and drugs.⁷⁶

It is claimed that 90 per cent of the trading fees generated through the sale of this cryptocurrency will go towards fighting the proliferation of the pandemic through not for profit organizations.

In addition, central bank digital currencies (CBDCs) could also provide useful tools in connecting financial resources to individuals, businesses, NGOs and government.

F. Remittance Services

⁷⁰ Anna Irrera, ‘CoronaCoin: Crypto Developers Seize on Coronavirus for New, Morbid Token’, *Reuters* (28 February 2020) <<https://www.reuters.com/article/us-china-health-crypto-currency/coronacoin-crypto-developers-seize-on-coronavirus-for-new-morbid-token-idUSKCN20M32A>>.

⁷¹ Billy Bambrough, ‘Bitcoin and Crypto Investors: Avoid this New Cryptocurrency Like the Plague’, *Forbes* (10 March 2020) <<https://www.forbes.com/sites/billybambrough/2020/03/10/bitcoin-and-crypto-investors-avoid-this-new-cryptocurrency-like-the-plague/#68a360886cdb>>.

⁷² ‘Fighting Decease with Finance: Pandemic Bonds, a New Idea’, *The Economist* (27 July 2017).

⁷³ ‘World Bank’s Pandemic Bonds Sink as Coronavirus Spreads’, *Financial Times* (24 February 2020).

⁷⁴ Hanna Ziadi, ‘These Bonds were Supposed to Help Fight Deceases Like Coronovirus. They’ve Never Paid Out’, *CNN Business* (15 February 2020) <<https://edition.cnn.com/2020/02/15/business/pandemic-bonds-coronavirus/index.html>>.

⁷⁵ Samuel Haig, ‘HashCash Consultants to Launch “Corona Fund Index Cryptocurrency”’, *Cointelegraph* (23 March 2020) <<https://cointelegraph.com/news/hashcash-consultants-to-launch-corona-fund-index-cryptocurrency>>.

⁷⁶ *Ibid.*

Remittances serve as an important lifeline for many economies around the world (Philippines, Bangladesh,⁷⁷ Nepal). Based on central bank data, of the top 30 remittance recipient countries, 19 have reported declines in the first 2 months of 2020.⁷⁸ The situation is expected to worsen as the pandemic progresses and travel bans continue. Despite some governments in remittance dependent economies denying the impact of COVID-19 on inward remittances,⁷⁹ the figures are clear. The effects of a global economic slowdown and widespread job losses will obviously impact low-skilled migrant workers in construction and hospitality industries in many regions where there will be a contraction in those sectors.

As noted in a recent Brookings study⁸⁰ on the impact of the Pandemic on Africa, remittances in 13 African countries are equivalent to at least 5 per cent of their GDP – and range as high as 23 per cent (Lesotho). Similar concerns are being voiced in relation to Latin American economies.⁸¹

With many sectors scaling back or ceasing their activities in line with social distancing mandates, only essential services are being allowed to continue. In most jurisdictions that includes banks.⁸² Non-bank exchange houses and remittance providers are not in such a clear category. The role of online remittances and the use of mobile money, digital wallets and other non-physical remittance digital infrastructure platforms will be a crucial. People are being limited from going to physical remittance service providers to send and receive money. Digital platforms, digital cash and digital wallets will be key to ensuring that the financial symptoms of the Pandemic are not harsher than they need to be for remittance-dependent countries.

G. Personal retirement funding

The impact of the virus on share markets around the world has exposed many retirees and near-retirees to massive losses. In jurisdictions where there are compulsory retirement savings obligations (401K in the US and the Superannuation system in Australia for example) share

⁷⁷ AKM Zamir Uddin, 'Remittance was Cruising; COVID-19 Popped-up and Made it Swerve', *The Daily Star* (15 March 2020) <<https://www.thedailystar.net/business/news/remittance-was-cruising-then-covid-19-popped-and-made-it-swerve-1880968>>.

⁷⁸ Ibid.

⁷⁹ Virgil Lopez, 'Gov't Sees Minimal Impact of COVID-19 on Remittances', *GMA News* (24 February 2020) <<https://www.msn.com/en-ph/money/topstories/govt-sees-minimal-impact-of-covid-19-on-remittances/ar-BB10jc1s>>.

⁸⁰ Brahima Sangafowa Coulibaly and Payce Madden, 'Strategies for Coping with the Health and Economic Effects of the COVID-19 Pandemic in Africa', *Brookings* (18 March 2020) <<https://www.brookings.edu/blog/africa-in-focus/2020/03/18/strategies-for-coping-with-the-health-and-economic-effects-of-the-covid-19-pandemic-in-africa/>>.

⁸¹ Gabriel Stargardter, 'How Vulnerable is Latin America to a COVID-19 Outbreak? Here is What the Data Shows', *Global News* (24 March 2020) <<https://globalnews.ca/news/6721847/coronavirus-covid-latin-america-data/>>.

⁸² Eg. Australia, see Ben Doherty, "'Non-essential' Services : What do Australia's Latest Coronavirus Restrictions Mean?", *The Guardian* (22 March 2020) <<https://www.theguardian.com/world/2020/mar/22/non-essential-travel-what-do-australias-latest-coronavirus-restrictions-mean>>; New Zealand, see Jason Walls, 'Covid-19 Coronavirus Lockdown: What is an "Essential" Service that Can Stay Open?', *New Zealand Herald* (24 March 2020) <https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12319181>. C.f. Germany and Italy, see Hans Seidenstuecker and Sinead Cruise, 'Some European Banks Shut Branches to Limit Coronavirus Spread', *Reuters* (17 March 2020) <<https://www.reuters.com/article/us-health-coronavirus-germany-banks/some-european-banks-shut-branches-to-limit-coronavirus-spread-idUSKBN2132QX>>; Hong Kong, see 'Some Bank Branches Temporarily out of Service', *Hong Kong Monetary Authority* (Press Release, 31 January 2020) <<https://www.hkma.gov.hk/eng/news-and-media/press-releases/2020/01/20200131-3/>>.

market fluctuations have caused the single biggest immediate losses to individuals of all financial impacts.⁸³ Retirement savings is one financial sphere where technology has yet to be as disruptive as in other contexts. Although most participants in these schemes are oblivious to what is happening to their savings, even if they wanted to actively participate in where or how their retirement nest eggs are invested, it would be far from straight forward. With managed funds, the best one could hope for would be a spectrum of investment options ranging from “cash” (less risky) to “high return” (more risky) investment configurations. The extent to which technology can assist individuals manage their retirements savings is even more acute with self-managed funds. The ability to execute changes in investment options rapidly can be greatly enhanced through digital technology (including DLT). At present, the lag between change requests and execution (up to several days) is too slow to respond to the pace of economic changes and government announcements taking place. Some investors in this space are therefore moving towards the “robo-advising” option in an effort to leverage technology to wrest back greater personal control of their assets.⁸⁴

Ironically, the newest technologies in financial management may benefit the oldest members of our community the most.

V. Risks of technologies

Digital finance brings important tools which can be very valuable, but also new forms of risk.⁸⁵ In particular there are increasing concerns about the robustness of fundamental digital infrastructure – the internet and communications systems – in addition to concerns about the digital financial infrastructure. The more people work remotely, the greater the stress on these systems, in particular on the internet generally and the security of VPN and other systems. Besides the obvious – insufficient bandwidth and reliability of server backbones – stresses can arise from issues such as shortages of spare parts for networks due to delays on shipping and border controls, and systems engineers being less available to install them due to illness or increased demand for their services. Further, increasing use of the internet could shift energy demand from industrial users to services and consumers – with a potentially detrimental effect on energy supply and infrastructure tailored for different user groups. The increasing ubiquity of digital finance also raises cyber risks in addition to digital infrastructure risks, whether of payments, securities, cloud or the internet.⁸⁶ Malicious actors have been quick to take advantage of the situation and governments have had to quickly distribute advice to citizens to make them

⁸³ Suzanne McGee, ‘Don’t Panic over your 401(K)! It’s Time to Emotionally Distance from the Markets’, *The Guardian* (23 March 2020) <<https://www.theguardian.com/money/2020/mar/23/what-to-do-as-the-markets-plunge-amid-coronavirus-establish-emotional-distance>>; Madeleine Morris, ‘What Coronavirus has Done to your Super – and Why you Shouldn’t Panic’, *ABC News* (19 March 2020) <<https://www.abc.net.au/news/2020-03-19/coronavirus-covid-19-what-has-it-done-to-superannuation-shares/12069628>>.

⁸⁴ Ross Snel, ‘Robo-advisor Account Sign-ups Surge amid Pandemic’, *Barron’s* (1 April 2020) <<https://www.barrons.com/articles/robo-advisor-account-sign-ups-surge-amid-pandemic-51585757592>>. The price volatility and rapid changes in circumstances arising from the pandemic have created clear arbitrage opportunities that high frequency trading platforms have been able to exploit: see John Detrixhe, ‘High-frequency Traders are Winning Big Thanks to Coronavirus Disruption’ *Quartz* (5 April 2020) <<https://qz.com/1832540/high-frequency-traders-winning-big-amid-coronavirus-disruption/>>.

⁸⁵ Buckley et al, (n 19).

⁸⁶ Buckley et al, (n 19) 1.

aware of this growing threat.⁸⁷ Moreover, digital proliferation brings increasing risks of crime, with the most rapidly growing area of crime being digital crime.⁸⁸

Finally, a major policy consideration will be how technologies (such as digital identification and tracking) can be misused. In addition to control over the movement of people, we have also good reason to fear interference with free speech and the right to express opinions – all in the name of health. Apparently justified by medical needs we already see early examples where executive emergency powers are abused – we expect this trend to continue the longer the crisis continues and to the extent that the crisis erodes the stability of a country’s institutions.⁸⁹ There is growing evidence and concern of surveillance, these technologies were being used before the crisis with significant criticism.⁹⁰ The crisis however is being used to show how this technology is useful to help ‘save lives’ which is increasingly being deployed could stay in place well after this crisis is over.

VI. Conclusion

A crisis is not the time to try to implement entirely new digital and technological solutions. It is the time to use the digital infrastructure already in place to far greater and potentially new effects, and the best way to do this may well be for governments to convene (electronic) gatherings of financial sector and fintech experts to explore what can be done in each country. Mobile money and other payment infrastructures can be used to direct targeted payments to the people and small businesses most in need. These digital payment infrastructures offer speed and traceability. Trust and certainty need to be preserved and enhanced. Rapidly effected support payments going to those who need them most work to achieve both ends.

As quarantine procedures are being implemented in most countries, millions of people around the world are being restricted from leaving their homes in what is dubbed “social distancing”. This is changing people’s habits. This change can be measured by looking at the significant spike in e-commerce activity,⁹¹ home entertainment use adoption⁹² (ie. streaming services) and home delivery services.⁹³ Digital financial services and payment platforms are a key component of the online commercial sphere people have been forced to use.

⁸⁷ ‘Past Updates on COVID-19 Local Situation’, *Ministry of Health Singapore* (Updated 15 April 2020) <<https://www.moh.gov.sg/covid-19/past-updates>>.

⁸⁸ Arner, Barberis and Buckley, ‘Evolution of FinTech’ (n 27) 1292.

⁸⁹ Ramya Vijaya et al, ‘Coronavirus Versus Democracy: 5 Countries Where Emergency Powers Risk Abuse’, *The Conversation* (7 April 2020) <<https://theconversation.com/coronavirus-versus-democracy-5-countries-where-emergency-powers-risk-abuse-135278>>.

⁹⁰ Zak Doffman, ‘Why We Should Fear China’s Emerging High-tech Surveillance State’, *Forbes* (28 October 2018) <<https://www.forbes.com/sites/zakdoffman/2018/10/28/why-we-should-fear-chinas-emerging-high-tech-surveillance-state/#7a64a0184c36>>.

⁹¹ Seb Joseph, ‘As Coronavirus Outbreak Grinds on, E-commerce Operations Buckle under Increased Pressure’, *Digiday* (24 February 2020) <<https://digiday.com/marketing/coronavirus-outbreak-grinds-e-commerce-operations-buckle-increased-pressure/>>.

⁹² Todd Spangler, ‘Coronavirus Spread Benefits Netflix, Other ‘Stay-at-Home’ Companies, Analysts Say’, *Variety* (28 February 2020) <<https://variety.com/2020/digital/news/netflix-coronavirus-benefit-stay-at-home-stocks-1203518686/>>.

⁹³ Andrew Keshner, ‘If the Coronavirus Spreads in America, Food Delivery Companies Could See a Surge in Demand – Are They Ready?’, *MarketWatch* (2 March 2020) <<https://www.marketwatch.com/story/if-the-coronavirus-spreads-in-america-food-delivery-companies-could-see-a-surge-in-demand-are-they-ready-2020-02-28>>.

The response to COVID-19 is essentially a largescale social experiment. The shock is priming people's behaviour towards more online and digital options. Once the crisis resolves, it is very likely that the habits, cost savings and convenience factors revealed to large swathes of consumers through this crisis will result in permanent behavioural changes.

There is a precedent. Following the 2008 crisis, financial institutions began to favour video-conference meetings over cross-border travel as part of cost cutting measures. Banks invested in the necessary hardware and people were incentivized to use these (at the time – new) tools. Ten years later, videoconferencing is the norm for many meetings around the world and is sustaining many sectors (such as education and shareholder meetings) in these unprecedented times.

Given that the digital infrastructure already exists, the COVID-19 outbreak will likely be the catalyst propelling an even faster adoption of activities relying on digital financial services. In the meantime, the intelligent, creative use of digital means offers much in the battle to alleviate the social, economic, and some health consequences of the crisis.

From a personal standpoint, as individuals, we each need to focus on maintaining our own health and that of those around us. We also need to focus clearly on understanding facts and analyses as opposed to panic and rumours. Take care of your health but also think, think carefully about the information you are acting upon, and think carefully about your actions from the standpoint of your friends and family. Take the time to reach out. It always helps.

From the standpoint of businesses, this is the time to think about that shop or restaurant or company that produces something you like and maybe not drop in, but see if you can order something online. And this is where the real power of digital finance comes in. The ability to use systems of ecommerce that allow us to avoid face to face interactions at times where that is necessary and better direct financial resources where they are most useful.

From the wider social context, be aware that your actions have an important role in how we all go through this together, and think about what is happening in your immediate neighbourhood, and how this is progressing more broadly.

And from the standpoint of industry, think about how you can use technology to reach out to governments, to businesses, to individuals, to NGOs, and to international organizations, to put your expertise to use in better solving their problems.