The impact of the 4th industrial revolution on the South African financial services market

(Executive summary)

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Executive Summary

Technological innovation is taking place at unprecedented speed. It is disrupting almost every industry in every country around the world. This is the fourth industrial revolution, where technological advancements like artificial intelligence and the "Internet of Things"[1] mean that human and digital systems can interact more profoundly than ever before. Applying this technology in financial services – called fintech – has the potential to reduce costs and improve efficiency, allow customers to transact seamlessly and in real time, and improve providers' understanding of customer behaviour and needs, allowing for the personalisation of financial services.

As with all past industrial revolutions this introduces a great degree of uncertainty. Regulators and policymakers are faced with the challenge of managing the implicit trade-offs. Digital innovation has the potential to broaden financial inclusion but can also exclude consumer segments with low levels of digital and financial literacy. The shift towards automation creates vast opportunities for improving efficiency but also impacts financial institutions' skill requirements, potentially entrenching the existing "low-skill low-pay" and "high-skill high-pay" labour divide.

South Africa makes for an interesting discussion on how these impacts may play out. The country's world-class sophisticated financial sector exists within the confines of a developing economy subject to income inequality, unemployment and skills shortages. The country's significant potential for digital innovation must be considered alongside concerns of whether this will be exclusionary, and whether the

[1] The interconnection of devices and systems using the internet, enabling them to collect and exchange data.

transformation will enhance or diminish domestic value creation.

This report investigates the impact of digital disruption in South Africa's financial services sector. It provides a domestic analysis of fintech and digital adoption across core banking functions, investigates how incumbent financial institutions are responding to this, and what the regulatory impacts and considerations of this rapidly changing digital landscape are.

South Africa in the global context

Fintechs in markets like China, the US, Canada, Israel, Hong Kong and much of Europe have attracted a large amount of investment. Fintech innovation in these markets is disrupting incumbent banks and disintermediating some financial markets.[2] While the value of fintech investment in Africa is comparatively low, Africa is often seen at the forefront of mobile financial innovation. The high uptake of mobile phones and relatively underdeveloped banking infrastructure has fostered an explosion of mobile financial services offered through feature phones.

South Africa's large and sophisticated financial sector is accentuated by a small but growing fintech industry, with two emerging fintech hubs in Johannesburg and Cape Town. Although fintech start-ups are supported by a number of fintech incubators, most struggle to gain traction and develop sustainable business models.

South Africa's funding environment is not well suited to supporting high-risk start-ups[3], and fintechs may struggle to attract international investment due to South Africa's lacklustre ratings against classic investment considerations[4]. A shortage of entrepreneurial skills generally within the country[5], combined with a lack of deep financial sector

[2] Citi GPS, (2016), *How Fintech is Forcing Banking to a Tipping Point*
[3] Based on stakeholder interviews conducted by Genesis Analytics, July-September 2017.
[4] Quantum Global, (2017), *Africa Investment Index*
[5] GEDI, (2017), *Global Entrepreneurship Index*

knowledge and experience among fintech start-ups, creates issues of credibility when looking for funding and partnerships[6]. Lastly South Africa's current financial regulation has not created an enabling environment for fintech development. A lack of clarity and guidance on how fintechs fit into existing regulation means South Africa's comprehensive regulatory environment is daunting for fintech start-ups and generates significant compliance risk.

The uptake of digital and fintech innovation in South Africa is also constrained by the consumer market. South Africa's population has a high level of income inequality. The vast majority of consumers exist in the low-income mass market where paid work is scarce, and many earn an income from the informal (and largely cash) economy.[7] Although South Africa has a high rate of financial inclusion (77% of the adult population are banked including South African Social Security card holders), the bulk of financially included adults are less than adequately served. The uptake of financial products is severely constrained by a poor knowledge and understanding of available financial products, and by income – more than 80% of the population live in an "in the now mind-set" leaving little room for savings, investment or insurance products.[8] Digital products and services have to compete with the high dependence on cash as a payments instrument, driven by the preferences and behaviour of low-income consumers.[9]

As a result, the digital and fintech innovation in South Africa largely caters to a niche, relatively affluent and financially-savvy consumer market. Although there is rising adoption of smartphones and an incoming generation of millennials more familiar with digital technology, translating this into the use of more sophisticated financial services is constrained by the state of South Africa's digital ecosystem and

[6] Based on stakeholder interviews conducted by Genesis Analytics, July-September 2017

[7] *FinMark Trust, (2016), Finscope consumer survey South Africa*

[8] *Ibid.*

[9] Genesis Analytics, (2016), *primary research on behavioural barriers to card usage in the mass and low income market*

the relatively low levels of financial literacy.

Fintech innovation in South Africa

Fintech innovation is occurring across the financial services industry in South Africa. This report uses a classification originally developed in the World Economic Forum's *Future of Financial Services* report to identify innovation in the five key banking functions of payments, deposits and lending, capital raising, investment management, and market provisioning.

Payments

The development of smartphone payments in South Africa through digital wallets and mobile banking apps are allowing customers to store card details digitally and transact using their mobiles. E-commerce and other card-based payment platforms are allowing customers to transact without merchant authentication of a physical card, or by streamlining electronic funds transfer payments. Contactless near field communication technology is allowing physical card payments to be made considerably faster. The development of mobile POS devices is reducing the cost and complexity of device management and quick response code solutions like Snapscan and Zapper are eliminating the need for POS devices altogether. All of these developments are being supported by next generation security measures such as location-based identification, biometrics, and card tokenisation which protects customers and increases confidence in digital channels.

Innovation outside the traditional payment rails of card and electronic funds transfers has been significantly less disruptive in South Africa. Mobile money has not gained traction locally with most domestic start-ups and international brands closing operations. Crypto-currencies have potential to significantly disrupt the international remittance market by enabling users to securely transfer value with limited transaction costs,

near real time settlement and without the need for intermediaries. While South Africans have access to international crypto-currency platforms as well as domestically-developed crypto-currency wallets and exchanges, crypto-currency use remains niche. It requires digital access, financial savvy, broad acceptance, and trust in what is a new infrastructure.

Deposits and lending

In the credit market an alternative lending landscape is emerging which provides alternative ways of assessing credit and securing funding from lending products outside the banking system. This includes peer-to-peer lending platforms and alternative scoring methods that use unconventional data sources. South Africa has a handful of peer-to-peer lending platforms and novel methods of credit scoring are beginning to be used.

In the traditional deposits market banks are using digital innovation to provide customers with more personalised services that can be conveniently and flexibly accessed in real time. Most South African banks have modernised their channels with mobile applications and internet banking. Investec is the only bank in South Africa with a principally digital (branchless) offering but will be joined by Discovery Bank and potentially TYME in 2018. Banks in international markets are also beginning to rely on products and services from an array of innovative third party providers that exist and operate outside the bank's core banking architecture. This "banking as a platform" model has not been fully embraced by South African banks which are cautious of losing ownership of their customers, and whose legacy operating systems constrain their ability to connect with third party providers.

Capital raising

Alternative funding platforms have begun to emerge. These allow individuals and start-ups to source funding from a collection of investors

and philanthropists directly through an online market place. Crowdfunding is a nascent industry in South Africa - while a number of local crowdfunding platforms do exist, the vast majority only provide donation and rewards-based funding options. Of the investment-based crowdfunding platforms that are currently operating, most are platforms focused on investment in property developments. The equity crowdfunding platforms that have emerged in other markets are not yet present in South Africa.

Investment management

Robo-advisors are automating the human function of guiding investors' decisions by calculating risk profiles and providing a formulaic financial plan or investment portfolio. Automated investment platforms are providing access to a broad range of asset classes with lowered minimum investment requirements and automated portfolio management. Several automated advice or management platforms are available in South Africa. Individual investors are also being empowered to engage in their own asset trading. Retail trading platforms are providing algorithmic trading capabilities, and "copy trading" allows less experienced investors to automatically replicate the trade of more experienced investors. A handful of platforms enabling these functions have been developed in South Africa but are more common in foreign markets.

Market provisioning

In capital markets trading, superior data analysis and artificial intelligence technology is providing institutional algorithmic traders with the opportunity to react in real-time to events more quickly, consider broader sets of data, and refine their trading algorithms without human intervention. While algorithmic trading is less prevalent in South Africa than in more developed markets, it has been increasing in popularity. Traders are beginning to use new data sources and artificial intelligence tools like machine learning to inform their trading

strategies. A number of alternative stock exchanges are also emerging – such as ZAR X and 4 Africa Exchange – with low-cost fee structures, real-time settlement and the ability to trade without going through a broker.

How the incumbents are responding

Fintechs have evidenced how technology can be used to create agile, customer-centric and cost-effective financial service providers. Incumbent financial institutions are responding by incorporating fintech and digital innovation into their own operations, either through collaborating with fintechs or through setting up their own innovation teams.

Bank-fintech collaboration in South Africa has matured as the fintech market developed. The early approach among banks was to acquire fintech start-ups quickly so that they could not collaborate with competitors. This was "technology searching for a problem" as banks acquired technology solutions that were not addressing specific problems within the bank. The next phase of engagement saw banks setting up or sponsoring fintech incubators and corporate accelerators to support fintech development and identify investment opportunities. However, the success rate of participating start-ups developing into bank partners has been very low. In recognition of these problems, banks have shifted to a "problem searching for technology" approach where fintechs are sourced as vendors or partners to address a specific bank problem, with adequate buy-in and resources provided from business units and the bank's information technology department.

Banks have realised that the power of digital innovation is more than just replacing physical channels, but actually lies in creating a digital core. This allows for the provision of consistent, accurate, enterprise-wide data enabling decision making across the organisation, and facilitates process efficiencies to improve the customer experience and reduce internal costs.

Banks in South Africa have taken different approaches to realising this. Newer banks have the benefit of building their core systems from scratch using next generation technology, allowing them to introduce innovative banking services. Older banks face the challenge of transforming legacy core banking systems built in the 1970s and 80s. These systems are largely siloed and were not designed to be integrated or communicate with external systems. Some banks are choosing to overhaul these systems entirely, incurring very large upgrading costs in the short term to accrue the benefits of modern digital banking systems in the long term. Others are adding additional system layers to their existing core systems to support a wider range of digital applications and databases. While this allows the bank to take digital products to market quickly in the short term, large long-term costs will be incurred as legacy systems will have to be replaced eventually.

This transformation to next generation banking architecture allows banks to adopt more agile product development methodologies and integrate with innovative third party service providers easily. A number of technology advancements are assisting banks with this process. Application programming interfaces allow units within the bank and third parties external to the bank to access the bank's various systems. This allows fintech developers to create applications which draw data from the bank's operating system. Cloud services provide banks with virtual infrastructure to store data and access software applications online, with the potential for large cost saving, rapid product deployment and improved accessibility for third parties to bank data and operations.

Banks are also currently investigating whether the distributed ledger technology that underpins the well-known Blockchain ledger can be used to support traditional financial service operations. In theory distributed ledger technology is a hyper-efficient means to process and store large volumes of data among

numerous parties, and may have application in a number of financial service processes. South African banks are participating in local and international consortiums but as yet have publicised few meaningful use cases.

A bank's ability to digitally transform is founded on building a strong data capability. This allows banks to improve their risk management through real-time analytics; optimise their operations through enterprise-wide decisioning; and become more customer-centric through more relevant product development, personalised marketing and better customer retention. In addition to next generation banking systems that enable the easy extraction and flow of data, banks also need strong data governance to ensure that good quality data is used consistently and responsibly across the enterprise.

Banks in South Africa have been addressing both these underlying infrastructure and data governance needs. A number of technical capabilities are in place including artificial intelligence tools like machine learning. But many of the banks are still on the journey of embedding these functions enterprise-wide and ensuring that data is shared across the enterprise in a way that supports critical business decisions and ultimately improves customer-centricity.

The regulatory response

The pace of fintech innovation and the way it is changing the structure of the financial market is introducing and intensifying risks specific to technology in the financial system. The expansion of digital channels and provision of real time and remote access to services is creating additional opportunities for fraud and cybercrime. The increased use and sharing of data as a central function of financial services is intensifying data integrity and privacy risks. The rapid adoption of new and emerging technologies increases the possibility of technology and systems failure. Finally, partnerships between banks and fintechs or external technology

providers are introducing a greater degree of collaboration risk as some of these providers become systemically important.

For this reason, regulators must be aware of the issues and risks associated with digital innovation, and balance this against the positive impacts that it can have on financial services. A fintech appropriate regulatory framework - in conjunction with data-security, cyber-security, consumer protection and technology use laws - can mitigate these risks while supporting the fintech industry through regulatory clarity and obligations that match fintech's risk profiles.

Regulators across the globe have responded to this challenge in a variety of ways which can be mapped along a spectrum of reactive to proactive. The reactive approach is often pursued by resource-constrained regulators in markets where fintech has not been particularly disruptive. Regulators do not take an active role in trying to make fintechs succeed but do not actively stand in the way of their development, and adjust regulation when necessary. Financial regulators in South Africa have thus far largely taken a reactive approach.

In contrast, proactive regulators work closely with innovators to understand new fintech developments and regulatory obstacles to innovation, and support start-ups in addressing these challenges. Regulatory sandboxes are often used to permit fintechs to test products under lighter regulatory obligations, enabling regulators to keep pace with technological innovation and observe its impact on the market. Entry to these sandboxes is often subject to eligibility criteria which ensures that participants offer products and services that reflect the regulator's mandate – most often aligned with national objectives. Innovation hubs support sandboxes by providing early-stage start-ups with access to regulatory personnel to help navigate the current regulatory framework, as well as business, entrepreneurship and technical experts and funding.

The approach of South African regulators has thus far been informed by the low levels of disruption that fintech innovation has caused to the underlying activities and risks present in the financial system. However, regulators are implementing a number of changes which signal a shift to a more proactive regulatory stance. This shift will be increasingly important in the South African market for three reasons.

Firstly, the current regulatory environment is comprehensive and complex with the potential to significantly stifle innovation. Without explicit guidance, fintechs find this regulatory network difficult to navigate. This situation is worsened because workarounds to prevent a fintech business meeting the definition of one regulated financial activity often means that it would be subject to another piece of financial regulation. Adopting a more proactive regulatory stance will allow regulators to identify where this applies, and to take remedial action. Secondly, fostering innovation in financial services through proactive regulation is important for South Africa's development, contributing to national objectives and preserving the country's status as a world-class financial hub. Lastly, proactive regulators are better able to identify, monitor and react to the emerging risks and opportunities associated with fintech which are set to intensify as the pace of technological innovation increases into the future.

Conclusion

Encouraging digital innovation through fintech is important because of the significant benefits it can bring. South Africa's fintech industry is small and growing, but this growth is being impeded by a number of factors. The fintech industry has therefore not been as disruptive to the structure of South Africa's financial market as has been seen in other countries, and much of the impact of digital disruption is being felt by incumbent financial institutions transforming their operations.

As the pace of technological innovation in the fourth industrial revolution increases, the infusion of technology into financial services is presenting new risks to consumers and to the stability of the financial system. Regulators therefore have the difficult position of protecting the system from these risks while allowing innovation to drive the industry forward. While the regulatory approach taken thus far in South Africa has protected consumers, it has not focused on encouraging innovation within the sector. This represents a missed opportunity for South Africa as a thriving fintech sector has the potential to contribute to employment, and improve access to a sophisticated suite of financial services among a broader set of consumers.

Regulators in South Africa have already indicated interest in shifting to a more proactive regulatory stance. However, financial regulators can only do so much to "future proof" the industry against the changes the fourth industrial revolution brings. Much of how the transformation of production and consumption will play out rests on the state of the broader digital ecosystem. Policymakers should therefore consider investments in broad digital infrastructure and develop the skillsets required by employees in this new world of work. This will ensure broad access to digital innovations and keep the value creation from technological innovation in the country.