



# BANK X

The New New Banks

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**Citi GPS: Global Perspectives & Solutions**

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# BANK X

## The New New Bank

**Kathleen Boyle, CFA**  
Managing Editor, Citi GPS

Is your bank giving you the best customer experience? Has it embraced the digital age like other services you deal with daily? A substantial number of new entrants into the banking sector think that answer is no and that they can provide a new banking model using technology and digital channels to deliver a better digital customer experience

During the Great Financial Crisis, legacy banks turned their focus to cost and capital optimization to help drive profitability amid a backdrop of slowing revenue growth. New regulations and changing business practices meant that technology investment was diverted towards regulatory and compliance challenges. While this was happening, smaller 'challenger banks' began to emerge driven by FinTech startups. These challenger banks were designed around the digital revolution and were able to leverage data insights via agile technology stacks. With these insights, they offered a customer personalization in their financial services and a fully digital banking experience.

As noted in the report that follows, legacy banks often have data that is stuck in multiple silos supported by core banking technology that was literally built in the age of black and white television. Manual intervention is high, which slows down operating speed, reduces flexibility, increases costs, and ultimately degrades efficiency and experience. Because a lot of digital technology isn't part of core banking technology, challenger banks tend to be quicker at incorporating new products and processes onto their platforms and help to easily connect with third-party products — offering more choices to the end user.

Three types of challenger banks have emerged: (1) standalone challenger banks, which are primarily FinTech companies leveraging technology and data to streamline retail banking by offering better convenience and pricing; (2) incumbent-led challenger banks, which are started within legacy banks through investment in technology and by creating new digital-only banks; and (3) BigTech-led challenger banks, which are created through GAFA (Google, Apple, Facebook, and Amazon) and BAT (Baidu, Alibaba, and Tencent) and who can use their vast networks to acquire customers quickly as they branch out into financial services.

The challenge for incumbent banks is that while digitalization can lower costs by 30-50% (primarily through a decline in full-time employees as technology disintermediates workers), new competition and greater transparency are likely to lower revenues by 10-30%. We expect the digital disruption risk to start in payments and then widen to other financial products. The tipping point for incumbent banks is if their core businesses of savings and loans are impacted.

Creating an 'incumbent challenger' sounds like an oxymoron, but as legacy banks recognize the threat that new entrants into banking are posing to revenue and customers, they need to reinvent themselves and reimagine banking. This involves legacy banks partnering with technology companies to create effective joint ventures as well as moving into more disruptive technology and business models to transform themselves into digital competitors

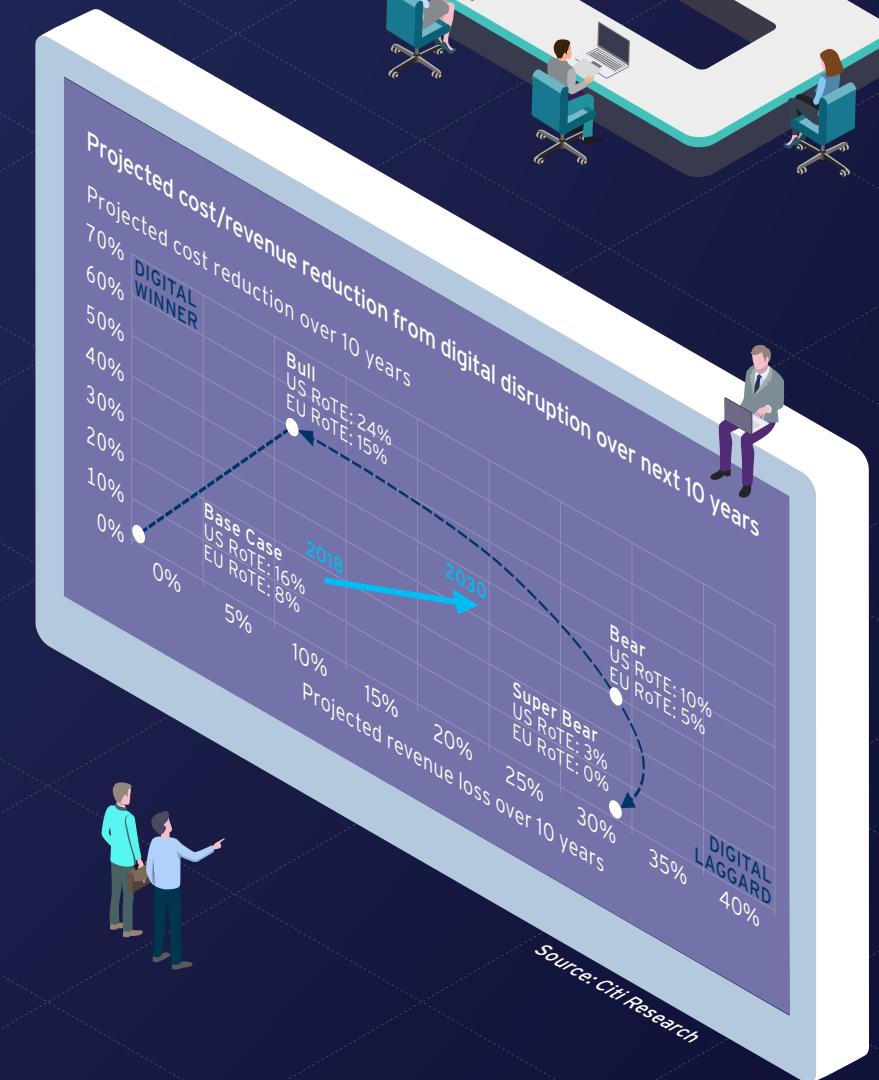
By creating their own Bank X, we believe legacy banks can transform themselves from slow moving caterpillars to agile butterflies.

# The Rise of Challenger Banks and Mobile Money through Digitalization

SIMILAR TO OTHER GIG ECONOMY SECTORS,  
DIGITAL BANKING CAN RUN WITH LESS  
FULL-TIME EMPLOYEES, ESPECIALLY  
IN THE O&T AREAS



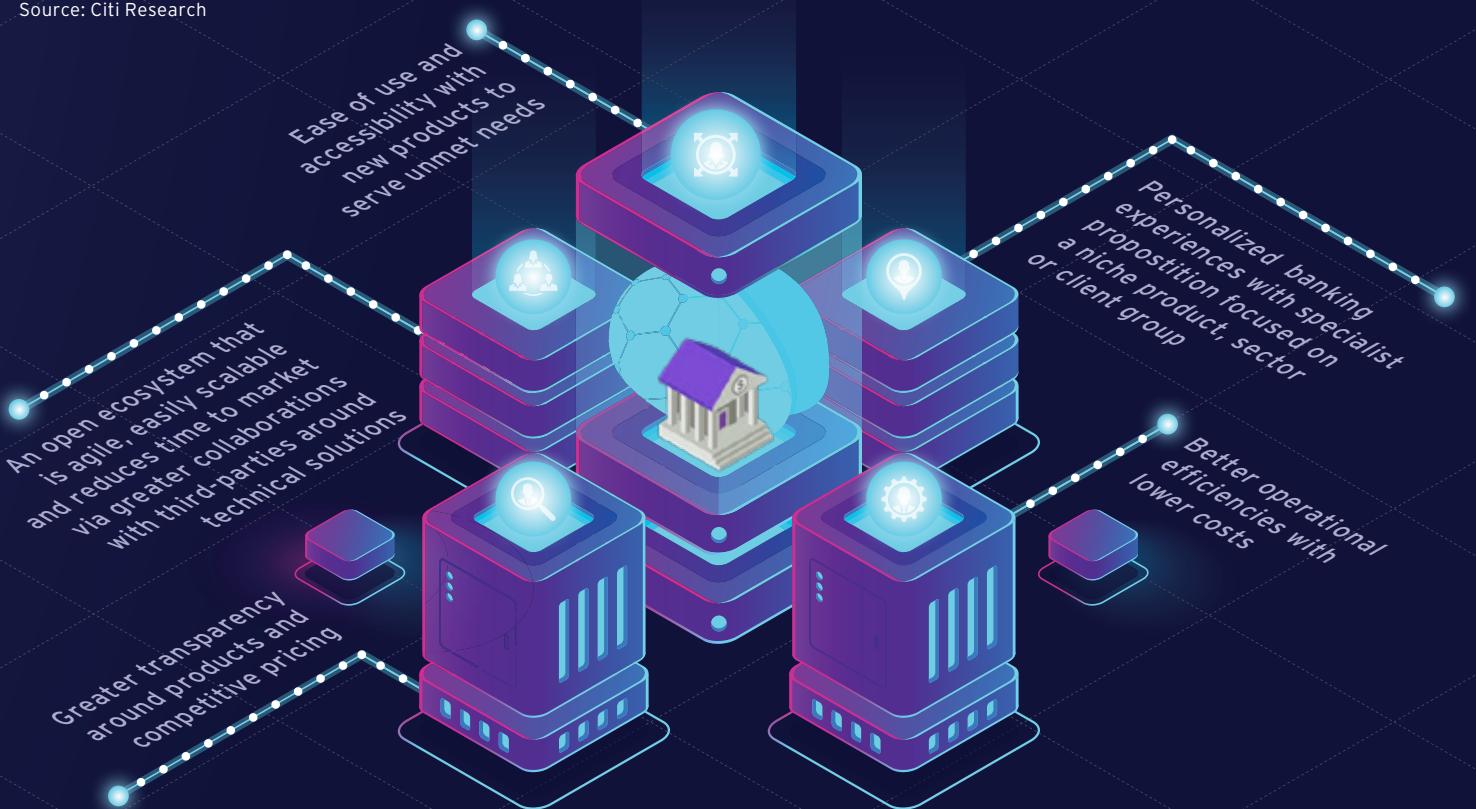
A DECLINE IN FULL TIME EMPLOYEES WILL  
DRIVE COST SAVINGS OF 30-50% FOR  
LARGE BANKS OVER TIME, HOWEVER NEW  
ENTRANTS AND INCREASED COMPETITION  
IN GENERAL COULD ALSO RESULT IN  
REVENUE LOSSES OF 10-30%



**THREE TYPES OF CHALLENGER BANKS – STANDALONE DIGITAL PLATFORMS, DIGITAL-ONLY BANKS EVOLVED FROM INCUMBENT BANKS, AND BIG TECH EXPANSIONS INTO FINTECH – ARE TAKING SHARE BY BETTER ALIGNING WITH CUSTOMER EXPECTATIONS**

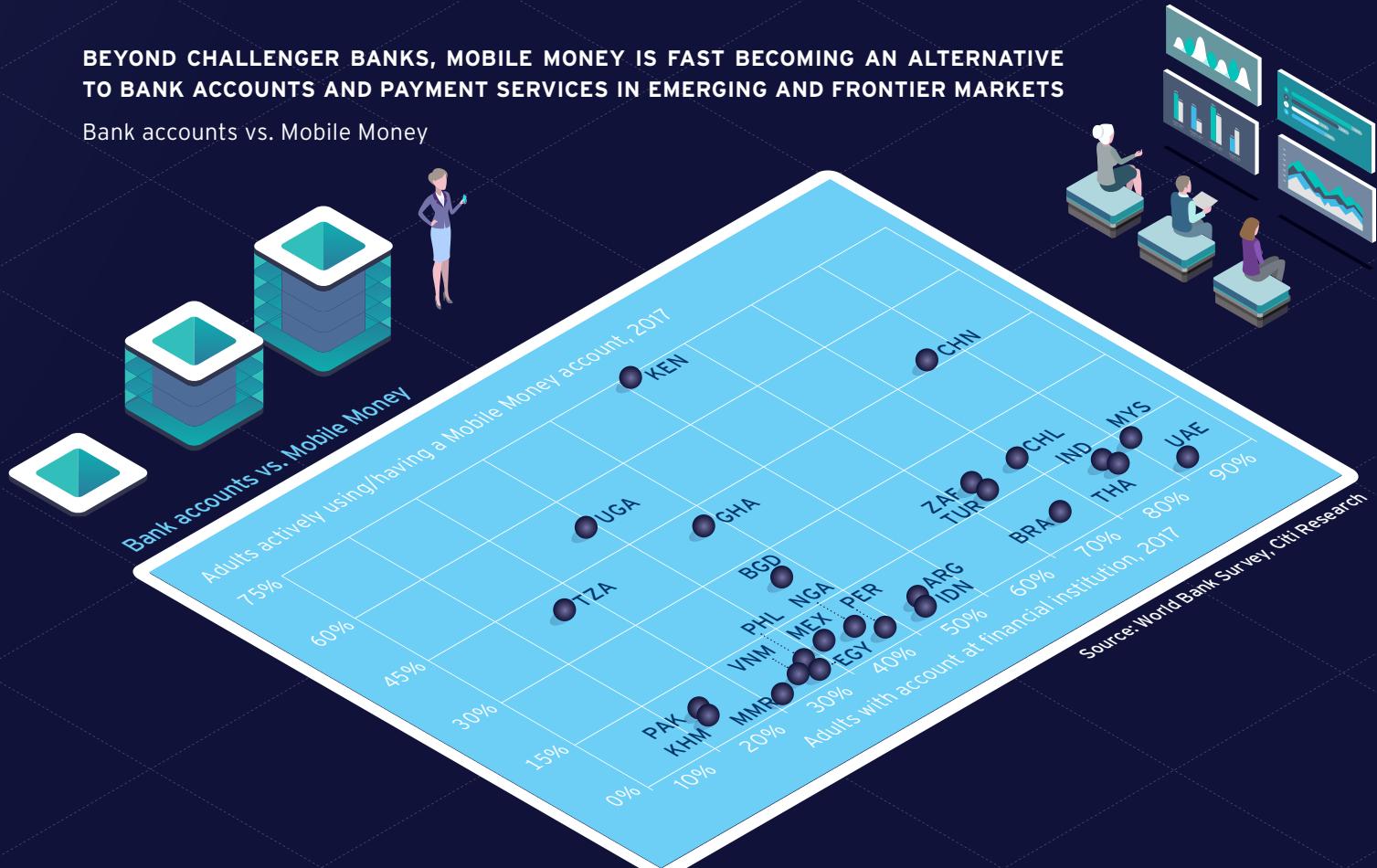
Banking Sector Pain Points Targeted by Challenger Banks

Source: Citi Research



**Beyond Challenger Banks, Mobile Money is fast becoming an alternative to bank accounts and payment services in emerging and frontier markets**

Bank accounts vs. Mobile Money



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# Bank X: An Introduction

## Banking is Broken – Time to Reboot

*"I couldn't fix the broken banks – so I quit to start one of my own"*

*"Banks were so focused on getting rid of their bad loans and reducing their staff headcount that they'd forgotten about customers. Customers had changed – but banks hadn't noticed."*

– Anne Boden, Founder and CEO of Starling Bank (Daily Mail, 16 Feb. 2019)

The idea of banks began as long ago as 1,800 BC in Babylon expanding with the Roman Empire, along with roads and Roman law. Banks accompanied the Italian Renaissance and then a few centuries later the growth of Northern Europe through trade, empire, and industrialization. Banks were not just for the rich and famous. Ordinary working people pooling their resources created their own savings banks and credit unions across the nineteenth century.

Banking, as with the broader economy, goes in cycles. And we are in the midst of a big cycle. In Asia and emerging markets, new entrants have entered the financial world, enabled by the ongoing digital revolution. In Europe, and to an extent in the U.S., banks are facing existential questions around profitability and business models.

As the quote above from Anne Boden reminds us, banks in the U.S. and Europe, engulfed by the Global Financial Crisis, focused on firefighting and survival. Remediation and restructuring were the mantras of the day. Few bankers had the luxury of time or money to think about how to reimagine banking.

But banking today does need re-imagining. Client experience, especially for retail and small and medium-enterprise (SME) clients, can border on the farcical and profitability levels especially in Europe remain poor. Before we look at some of the solutions from a Bank X future, a quick look at why the status quo does not work.

Horror stories around client experience failures are only too common. The small business account that takes from one to three months to open — or the loan that is denied on the basis of standardized box ticking that is unable to accommodate the volatility of young companies.

A recent anecdote of an archaic banking client experience comes courtesy of an ex-colleague who moved to Hong Kong a few months ago. Let's call her Jane. She started work at her new Big Bank on January 7th. Armed with her ID card, proof of address, and her application form she walked over to a bank branch on January 11th.

Jane had filled out her details on a paper application form. The bank official then manually input the details into a computer at the branch — a good reminder of the large amount of manual intervention in 2019 banking in one of the richest cities in the world. The application process in total took an hour.

The good news for Jane: her new ATM card was produced straight away. The bad news: an ATM card in Hong Kong can't be used for in-store or on-line payments. To avoid paying for all her purchases in cash Jane needed a credit card. The credit card arrived on February 12th, a full month after she walked into the branch.

Credit checks take time. But should they take almost a month? Jane was already a client of this same banking group back in London — and a profitable and valuable client of the U.K. bank as well. But the bank did not know who Jane was. Yes, data is hard to share cross-border but can banks not find a work around?

In our original Citi GPS [Digital Disruption](#) report, we had written about another former colleague who didn't move countries but did move from working for a Big Bank to running a small business. It took him over a month to open his SME account. And this was a bank he had been a consumer client of for decades.

Not surprisingly, when this former colleague opened his next business the following year he decided to try out one of the many challenger banks that were by now active. The onboarding experience at a digitally native new bank took minutes instead of over a month — and this was despite the lack of any pre-existing client relationship.

The three letter acronym KYC, or Know-Your-Client, is best known in banks from a compliance and anti-money laundering (AML) perspective. But while banks wrestle with their AML requirements they appear to forget that KYC also has a client service perspective. Banks have so much data on their customers. Yet they don't know them.

Legacy banks often have data that is stuck in multiple silos supported by core banking technology that was literally built in the era of black and white television. Manual intervention is high, which slows down operating speed, reduces flexibility, increases costs, and ultimately degrades efficiency and experience.

Of course sometimes such failures lead to positive outcomes. For example, one entrepreneur that got turned down for an SME loan then decided to build their own bank. That was the story of OakNorth — whose CEO, Rishi, Khosla we will talk to later in the report.

Many senior bankers had the same idea as Rishi. It was time to reinvent banking for the digitally-enabled, mobile-first, twenty first century. Anne Boden is a great example of re-inventing banking. After almost four decades in senior roles in big banks, Anne decided the only way to fix banking was to start with a blank sheet of paper.

Anne left the world of incumbent banks to create her own Bank X from scratch: an independent challenger bank called Starling, established in 2014. Anne's view was that the cost base and complexity of incumbent banks was too hard to fix. A digitally native bank by contrast would have much a lower cost structure.

Challenger banks began to be built in the mid-2010s by new entrants. Pretty soon, incumbents were looking to partner with challenger banks or even launching their very own Bank X's. An early mover was Bank Leumi, which launched Pepper in 2017 following two years of work.

Later in 2017, RBS launched a process for creating a new SME banking business that would later be called Mettle, helped by digital transformer 11:FS. By 2018, RBS were also working with Starling Bank on a consumer proposition ('Bo'). By 2019 it appeared as though nearly every incumbent bank wanted its own Bank X.

"Incumbent challenger banks" are a group we will meet in in the second half of the report, which includes granular discussions with the CEOs of Israel's Pepper, Standard Chartered's Hong Kong Virtual Bank and 11:FS Foundry, who are helping build digital challenger banks in the Americas, EMEA, and Asia.

So-called recovering bankers have set up their own firms to help incumbent banks create their own Bank X or transform themselves into a Bank X as a whole. As Antony Jenkins, the former CEO of Barclays, says in our discussion with him later in this introductory section of the report:

*"The question that I asked when I left Barclays was: is it possible to create a new platform to deliver banking services in a way that is 10 times better than the traditional method. 10 times better for the bank, 10 times better for its customers and crucially 10 times better for society?"*

## A Brief History of Banking: The Last 4000 Years

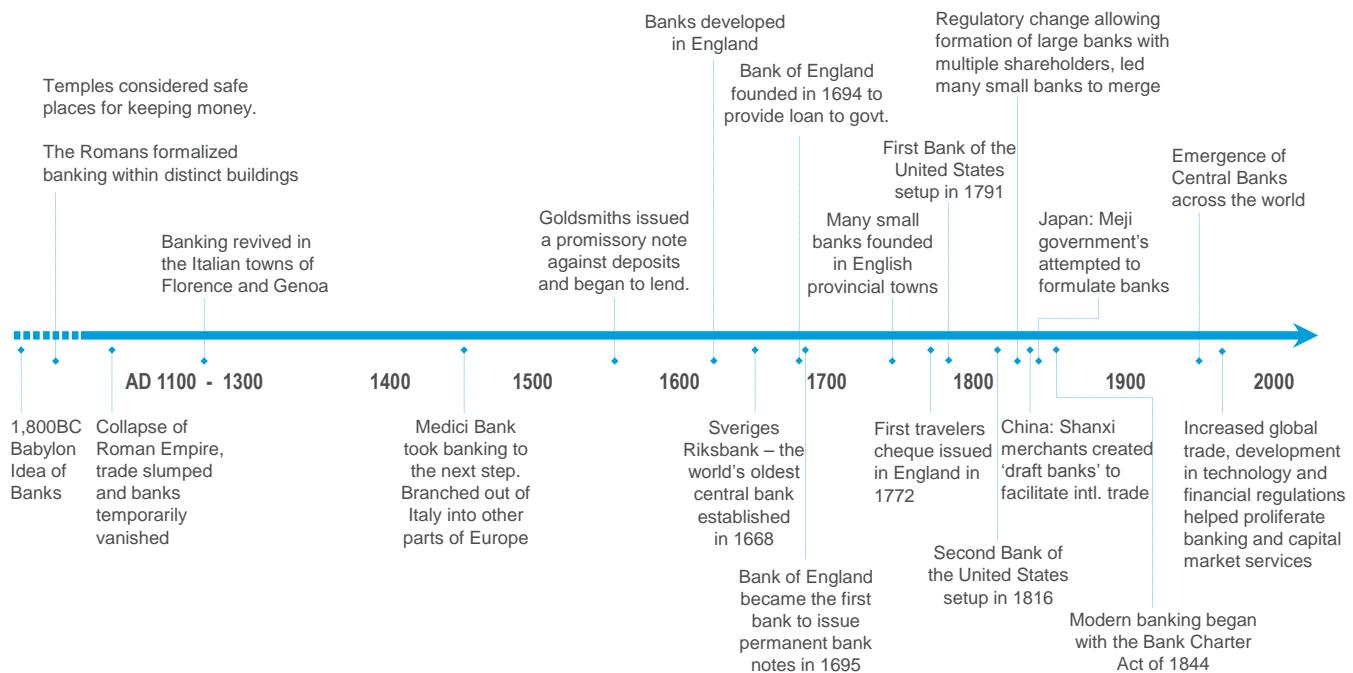
The idea of banks began as long ago as 1,800 BC in Babylon. The advent of coins, however, simplified banking as they were easier to keep and exchange than other commodities. In those days, temples were considered safe places for keeping money and they also loaned that out to people.

The Romans took banking out of temples and formalized it within distinct buildings. During this period, moneylenders in Rome and Greece made loans, accepted deposits, and changed money.

However with the collapse of the Roman Empire, trade slumped and banks temporarily vanished. However banking began a revival in the 12th and 13th centuries in the Italian towns of Florence and Genoa. The Medici family took modern banking to the next step with Medici Bank in the 15th century, charging a fee for currency exchange, diversifying risk, and creating new accounting practices.

### Birth of Banks in England

In England, banks developed in the 17th century. Before that people deposited their money with goldsmiths for safety. The goldsmiths issued a note promising to pay the bearer a certain sum on demand. In time people began to exchange these notes instead of coins because it was easier and safer. Goldsmiths began to lend the money deposited with them in return for a high rate of interest. They also paid interest to people who deposited money in order to attract their savings.

**Figure 1. Evolution of Banking**

Source: Citi Research

Not only individuals borrowed money, governments also needed to borrow, especially in wartime. Before banking, a government would borrow money from wealthy individuals and later repay them with interest from taxation.

However at the end of the 17th century, the cost of fighting a war with France was colossal. So in 1694, the Bank of England was founded to provide a loan to the government. In return, the bank received interest on the loan and the right to issue notes. The Bank of England became the first bank to begin the permanent issue of banknotes in 1695. This put England as the financial center of the world.

Subsequently in the late 18th century, many small banks were founded in English provincial towns with the first traveler checks issued in England in 1772. The period also saw several crises, with run on banks in 1793, in 1814-1816 and in 1825, which resulted in loss of customer confidence and wave of bank failures. Regulatory change in 1826, allowed the formation of large banks with multiple shareholders, resulting in many small country banks merging with large banks.

### Evolution of Modern Banking

In the U.S., central banking was first setup in 1791 with the First Bank of the United States, headquartered in Philadelphia. The bank was however allowed to lapse in 1811 when its 20-year charter came to an end. Difficulties in funding the War of 1812 led to a second attempt at creating a central bank in 1816 — the Second Bank of the United States — which again lasted only for 20 years. Post 1836, state-chartered banks and unchartered banks took hold, issuing their own notes.

In England, modern banks began with the Bank Charter Act of 1844, which split the Bank of England into two departments – a banking department and an issuing department. Here onwards, the Bank of England could only issue notes if they were backed by gold or government securities. New banks were also forbidden to issue bank notes and gradually as banks merged, the Bank of England became the only bank in the country that could issue notes.

The emergence of Central Banks across the world is largely a 20th century phenomenon, including the current U.S. Federal Reserve, set up in 1913. Increased global trade, developments in technology, and financial regulations throughout the 20th century helped proliferate global banking and capital market services. This led to a drastic increase in the size of banking operations and their geographic spread, as we know today.

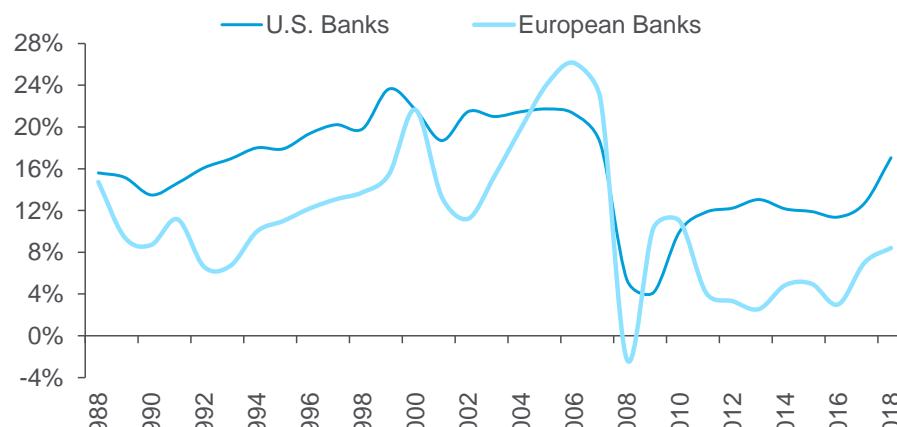
In the couple of decades prior to the global financial crisis, the banking sector benefited from several major tailwinds — deregulation, globalization, and new technology — which allowed for the growth of derivatives markets, online banking, credit cards etc. This helped keep banking sector revenue growth high versus costs and combined with low levels of capital, resulted in good returns on equity (ROEs).

### After the Global Financial Crisis

Post the global financial crisis, the profitability of banks declined as revenue growth slowed and banks needed to focus on cost and capital optimization to drive profitability. This fundamental shift from an era of high revenue growth to one of slower growth and ever higher amounts of capital and compliance costs has not been easy for banks.

Return on tangible equity (RoTE) at European banks has declined from mid-teen levels pre-crisis to single digits in the post-crisis era. Likewise, U.S. bank RoTEs lowered from high-teen to low teen levels in this period, before being helped by the recent tax cut which has driven a bump up in profitability.

**Figure 2. U.S. and European Banks Return on Tangible Equity, 1988-2018**



Note: Based on banks under Citi Research coverage

Source: Worldscope, SNL Financial, Citi Research

## Bank of the Future: Bank X

Many bankers, investors, and also customers are aware that banking as it stands today is broken. In recent years there has been increasing interest from 'recovering bankers' in creating new banks using a new model. Initially, these new banks were set up by former bankers or companies with roots in other industries as new entrants to the banking world, or challenger banks.

But more recently, incumbents have begun to launch their own challenger banks — B Bank as CYBG in the U.K. called it or Bank X as we call it generically in this report. These new banks aren't just about launching a new brand or a differentiated demographic targeting marketing strategy (though they can be that too). They are the banking world's equivalent of "building towards a moonshot", i.e., experimenting with new ways of doing banking to future-proof the existing firm. Will this strategy work for the incumbents? The jury is out. But in this report we outline the vision and the plans of challengers, from within and outside.

The founder of Google X, Sebastian Thrun, highlighted in a recent speech some key ideas about how to launch a moonshot (Wall Street Journal, February 26, 2019):

1. Innovation starts small. It happens in small teams.
2. Hire strategically. World class talent usually wants to work with peers.
3. Bring in fresh talent often.
4. Solve important problems.

Many of the challenger or startup banks that have launched in recent years follow most of the criteria set out above. They are usually small operations — Starling has 400 employees for example. They bring in fresh talent, often with roots from outside the banking industry — the Chief Technology Officer (CTO) of 11:FS who helped build Mettle, the SME challenger current account (checking account) for RBS, was previously CTO at Sporting Index.

Many of the new banks are looking to solve important problems beyond simplified onboarding. Inclusion is an important social theme and business opportunity: in emerging markets many new clients of the formal financial system are being onboarded by non-traditional banks while in developed markets many of the challenger banks are looking to improve SME banking, a segment often poorly served by incumbent banks.

### Bank X: Challenger Banks

The new banks are designed around meeting current customer expectations, leveraging data insights via agile technology stacks to offer customers better personalization and fully digital banking experiences. Challenger banks also tend to be quicker at incorporating new products/processes into their platform and help easily connect with third party products — offering more choices to the end-user.

Most challenger banks do not have physical branches and instead offer services remotely via online and mobile banking. The focus is often on underserved niches in the retail/SME sectors for large-scale customer capture, on the back of improved user experience, in an attempt to differentiate themselves from the big banks. Of course, for some client segments and products a physical presence is also needed.

**Figure 3. Reasons for Surge in Challenger Banks**

<b>Consumer Needs</b>	"Customers had changed – but banks hadn't noticed". Anne Boden, CEO and Founder of Starling Bank explains how she built an app-based bank around contemporary customer needs. Rishi Khosla of OakNorth says underserved clients, whether it is SMEs in the U.K. or Hong Kong, an emerging middle class in Asia or migrant workers across emerging markets like Safaricom in Kenya, are being provided with best in-class services.
<b>Technology</b>	The old and fragmented tech stack employed by incumbent banks is unable to deliver the client experience and efficiency required for contemporary banking. In our interview with Antony Jenkins, we discuss how one of the real impediments to banks being able to deliver what their customers want and what they need for their own shareholders is technology. While Antony and others are building cloud-native next generation platforms most bank technology transformation projects today are done by large vendors and we discuss this topic in our interview with Tanya Andreasyan.
<b>Regulatory Change</b>	Regulatory change is as important as technological change. Banking and financial services are a highly regulated industry and without a supportive regulator industry change is very difficult. As Megan Caywood says, the U.K. went in a different direction versus the world in 2013 when the FSA relaxed the regulatory norms for new banks. In our talk with James Lloyd he explains how regulatory change has changed the banking landscape in Hong Kong.
<b>Rise of Platform Companies</b>	BigTech, especially in Asia, has moved into payments and financial services and are offering these products to the huge user-base they have created for their core products. BigTech can scale fast and run their financial businesses on different profit metrics to incumbent banks. At the end of the report, we talk about how Kakao bank has emerged as a BigTech led challenger bank in South Korea.
<b>Competition</b>	Leda Glyptis, CEO of 11:FS Foundry notes " <i>Digital transformation is not about technology. It's about doing everything differently for the first time. It is mostly about updating and future-proofing what we have</i> ". To cope with competitive and technological change, new operating models and cultures are required, which is easy for independent challenger banks, but much harder for incumbents.
<b>Venture Capital Funding</b>	According to CBInsights, venture capital-backed FinTech deals and funding were at record high in 2018. VC-backed FinTech companies raised \$39.6 billion (+120% YoY) across 1,707 (+15% YoY) deals globally. Digital-first banks have flourished in the U.K./Europe under tech favorable regulations and funding environment. Our Q+A with Rishi Khosla, co-founder of OakNorth, highlights the importance of a favorable funding environment.

Source: Citi Research

Banking is also a scale and a trust business. The cost advantage that may be evident in technology and operations for challenger banks may be offset by higher client acquisition and (for balance sheet businesses) funding costs. A Bank X set up by an incumbent can of course mitigate some of the weaknesses in terms of cost of funding or client acquisition but they find it a challenge to fully replicate the lean and agile culture of an independent Bank X. The table below summarizes key strengths and weaknesses of challenger banks.

**Figure 4. Strengths and Weaknesses of Challenger Banks**

<b>Strengths</b>	<b>Weaknesses</b>
■ Better and completely digital customer experience	■ Unproven track record (with the exception of challenger bank operated by incumbent banks)
■ New technology stack and absence of legacy system reduces cost to serve	■ High customer acquisition cost in a saturated retail banking market
■ Interests of tech giants to open digital banks have the potential to completely redraw the retail banking landscape	■ Lower physical distribution cost could be offset by higher interest expenses
■ New digital channels and ease of account opening / servicing	■ Potential need to tap into the ATM network to meet the cash withdrawal needs of customers
■ Ability to tap into customers who are not physically able to visit branches.	■ High entry barrier and often lack of any regulatory arbitrage.

Source: Citi Research

**Figure 5. Banking Sector Pain Points Targeted by Challenger Banks**

- Ease of use and accessibility with new products to serve unmet needs
- Greater transparency around products and competitive pricing
- Personalized banking experiences with specialist proposition focused on a niche product, sector or client group
- An open ecosystem that is agile, easily scalable and reduces time to market via greater collaborations with third-parties around technical solutions
- Better operational efficiencies with lower costs

Source: Citi Research

## Challenger Banks: An Anatomy

We believe challenger banks can broadly be segregated into three categories, depending on their nature of origination – either led by standalone startups, incumbent-led banks, or created by tech/telecom companies.

### 1. Standalone Challenger Banks

Standalone challenger banks can be seen as FinTech companies leveraging technology and data to streamline retail banking by offering better convenience and pricing. The U.K., in particular, has seen the most challenger bank activity compared to other regions, as a result of progressive regulations enacted to promote competition and break up the banking monopoly.

There are a handful of startup banks: Starling, Atom, Tandem and Monzo in the U.K. All have banking licenses, while Revolut and Loot (also in the U.K.) are based on pre-paid cards which sit behind a third-party banking license. Starling and Monzo Bank run on in-house developed technology, while Atom, Tandem, and others run on vendor solutions.

Notably, it is hard for challenger banks to offer the same wide-range of products offered by incumbent banks, and directly compete with these large behemoths. However, some of the most common ways challengers have differentiated themselves are:

- Focusing on specific product segments at attractive pricing versus full-suite of banking products — e.g., Revolut offering credit cards with spot FX for overseas purchases or Starling Bank focusing on current accounts.
- Technology: a mobile-native offering is standard and the counterpoint to not offering a wide range of products and services is that simplicity and low/no-cost is core to whatever is offered. An interchange-based model is one way to not charge the customer, who tends to be a millennial. There tends to be a recognition that occasional checking services (say for rent, where card usage is less common, even now) and ATMs are needed and transparent vendor relationships typically fulfill this need.

- Offering the same service at lower revenue margins versus incumbent banks benefitting from the absence of legacy banking system. The challenge of an incumbents' digital journey is that their mobile banking applications are still running on a legacy core banking system. Hence the digital experience of customers can be clunky at times as can the pace of innovation versus newcomers.

## 2. Incumbent Bank-led Challenger Banks

Rising competition in the banking sector, changing customer mindset, and greater proliferation of smartphones have put pressure on incumbent banks to embrace digital. Many incumbent banks have started to invest in technology to improve customer experience and creating a new digital-only bank can help meet an evolving set of customer expectations quickly and effectively.

Setting up an independent challenger bank needs to be differentiated from digital transformations and core banking overhauls undertaken by incumbent banks. The former results in the setup of a new bank with independent application programming interfaces (API's) and technology stacks and is a significant departure from the incumbent bank's operating model.

Examples of incumbent-led evolution include ING Di-Ba, in which ING has owned a 100% stake since 2003. This now has 8.8 million customers, including 1.7 million customer accounts. ING has since rolled out similar models in Austria, France, Italy, and Spain, although it has supplemented these with a handful of branches, especially in Italy and Spain, due to different customer dynamics.

Hello Bank, by BNP Paribas, was founded in 2013 and now has >2.5 million customers across 5 countries (~1.5m of which are in Germany). Another more recent example is Bank Leumi and its digital bank 'Pepper', which is supported by Temenos. In each case these are 'new' banks and existing customers / products from the parent have not been migrated across.

## 3. BigTech Led Challenger Banks

The emergence of BigTech such as GAFA (Google, Apple, Facebook, and Amazon) and BAT (Baidu, Alibaba, and Tencent) in financial services has led to heightened competition in the financial services sector. We think the challenge BigTech poses for incumbent and standalone challenger banks is daunting, given the absence of any cost drag from legacy information technology (IT) systems and underused branch networks (common problems for banks) and their natural advantage in customer acquisition owing to their high user engagement models. Further, the diverse nature of these large tech companies could mean that cross-subsidization allows these firms to operate even while making losses in an attempt to grab greater market share.

In recent years, we have seen some evidence of successful challenger banks being set up by tech companies. One of the most prominent of these is in Korea, where popular social messaging app Kakao Talk, launched a digital-only bank in 2017, acquiring two million customers in a short span of just two weeks from launch date. Further, Kakao Bank's user base has continued to grow even in 2019, reaching around 6 million users, which accounts for about 15% of Korea's adult population.

Similarly in China, challenger banks such as MYbank and WeBank, backed by Alibaba and Tencent, respectively, have seen strong user-base growth following their launch in 2015. Today, WeBank, which offers unsecured lending, has 60 million customers in over 500 cities in China, by leveraging Tencent's social user base. In contrast, MYbank has leveraged Alibaba's strong merchant network on the e-commerce platform, by offering loans to over 5.7 million small and micro corporate users.

The experiences of Korea and China are successful examples of Internet companies venturing into banking. Lessons learnt include: (1) Incumbent banks should not be overly complacent with their existing customer base. The speed of customer acquisition could be much faster through digital channels than the traditional distribution channels; (2) Internet giants have a clear edge in certain areas of banking, especially around payments and mobile money; and (3) There are opportunities to cross-sell and scale to other products. Kakao Bank, for example, offers comprehensive product suits including deposits and personal lending.

Note that elsewhere in the world, there is a trend towards the “Banking-as-a-Service” paradigm and large tech companies have often ‘co-opted’ banking service components. These large tech companies sometimes use their market power (represented by their brands) to offer services that smaller FinTech vendors are willing to design and run on a white-label basis, just as certain banks are willing to ‘rent out’ the use of their bank charter. They sometimes take advantage of local social norms to create products that have traction — for example Amazon has a ‘cash load’ feature which enables consumers to buy products without a debit or credit card, i.e., cash on delivery. The interesting point here is that excess cash deposits, up to an allowable limit, can be stored in the Amazon pay account and can subsequently be used for bill payments, etc. Amazon provides credit to its small business partners, with the capital reportedly provided by Bank of America. Similarly, PayPal offers products like debit cards, check deposits, and small business loans.

### Challenger Banks in Asia Mostly an Offshoot of BigTech/Banks

We find notable variations amongst the challenger banks across geographies. Aside from the most obvious one of there being fewer challenger banks in Asia vs. the U.K and the U.S, we find that challenger banks in Asia are mostly either backed by large tech, telecom or traditional banks. For example WeBank, MYbank, and Kakao Bank are all backed by tech firms, namely, Tencent, Alibaba, and Kakao respectively or K-Bank and Jibun Bank who are backed by telcos. Incumbent banks such as DBS have also made progress with challenger setups such as digibank in India/Indonesia.

Challenger banks originating from startups intending to disrupt financial services in Asia (e.g., Neat in Hong Kong or Paytm in India) are by far fewer versus those originating from startups in the U.K. (e.g., Metro Bank, Monzo, Starling Bank, Tandem Bank). A limited regulatory framework for challengers in Asia (with the emerging exception of Hong Kong) and the presence of large tech companies (especially in China) may be some of the reasons why Asian challengers are more likely to be an offshoot of a bank/telecom.

Figure 6. Prominent Global Challenger/Digital-only Banks

Bank Name	Country	Key Stakeholder	Established	Bank Name	Country	Key Stakeholder	Established
ING Direct	Australia	ING	1999	K-Bank	Korea		2017
U Bank	Australia	NAB	2008	ALAT	Nigeria	Wema	2017
Volt	Australia		2017	Kudimoney	Nigeria		2018
Xinja	Australia		2018	Sun Trust Bank	Nigeria		2015
Agibank	Brazil		2017	Skandiabanken	Norway	Skandia	1994
Banco Inter	Brazil		2017	Tinkoff Bank	Russia		2006
Next	Brazil	Bradesco	2018	Touch Bank	Russia		2015
Nubank	Brazil		2014	Bank Zero	South Africa		2018
KB	Cambodia		2016	Discovery	South Africa		2018
EQ Bank	Canada	Equitable Bank	2017	Tyme Digital	South Africa, Indonesia		2015
KOHO	Canada		2014	Coinc	Spain	Bankinter	2012
Simplii	Canada	CIBC	2017	Imagin Bank	Spain	CaixaBank	2016
Tangerine	Canada	Scotiabank	1997	Openbank	Spain	Santander	1995
Baixin Bank	China	CITIC Bank, Baidu	2015	Collector Bank	Sweden	Fastighets AB Balder	1999
MYbank	China	Alibaba	2015	Flynt	Switzerland		2017
Suning Bank	China	Suning	2017	KOKO	Taiwan		2017
WeBank	China	Tencent	2015	O Bank	Taiwan		2017
Xinwang Bank	China	Xiaomi, New Hope Group	2016	Richart	Taiwan	Taishin	2016
Lunarway	Denmark		2015	TMRW	Thailand	UOB	2019
Boursorama Banque	France	Societe Generale	1995	CBD NOW	UAE		2016
Compte nickel	France	BNP Paribas	2014	Liv	UAE	ENBD	2017
Fortuneo Banque	France	Credit Mutuel	2009	Neo	UAE	Mashreq	2017
Hello Bank	France	BNP Paribas	2013	Atom Bank	U.K.	BBVA	2016
Soon Banque	France	AXA	2013	Bo	U.K.	RBS	2018
N26	Germany		2013	Monese	U.K.		2013
Fidor Bank	Germany		2009	Monzo Bank	U.K.		2017
Neat	Hong Kong		2015	OakNorth	U.K.		2014
Virtual Bank (to be established)	Hong Kong	Standard Chartered	TBD	Revolut	U.K.		2015
Paytm Payments Bank	India		2017	Starling Bank	U.K.		2017
DBS digibank	India, Indonesia	DBS Group	2016	Tandem Bank	U.K.		2013
Jenius	Indonesia	BTPN	2017	Bank of the Internet U.S.	U.S.		1999
Pepper	Israel	Bank Leumi	2017	BankMobile	U.S.		2015
CheBanca	Italy	Mediobanca	2008	FINN	U.S.	Chase	2017
FinecoBank	Italy	Unicredit	1999	Go Bank	U.S.	Green Dot Corp	2014
Oval Bank	Italy			iam Bank	U.S.		2016
Satispay	Italy			Marcus	U.S.	Goldman Sachs	2016
Daiwa Net Bank	Japan	Daiwa Sec	2011	Moven	U.S.		2013
Japan Net Bank	Japan	SMBC	2000	Simple	U.S.		2013
Jibun Bank	Japan	MUFG, KDDI	2008	USAA	U.S.		1922
Rakuten Bank	Japan	Rakuten	2000	MOMO	Vietnam		2016
SBI Sumishin Net Bank	Japan	SBI, SMTB	2007	TIMO	Vietnam	VPB	2016
Sony Bank	Japan	SONY	2001	OCTO	Vietnam, Philippines	CIMB	2018
Kakao Bank	Korea	Korea Investment Hldg.	2017	Zazu	Zambia		2018

Source: Company reports, Citi Research

## Why Banking is Broken and How to Fix It

### Interview with Antony Jenkins of 10X Future Technologies:

**Antony Jenkins**, founder and CEO at 10X Future Technologies, culminated a long and successful career in banking by running Barclays Plc. Before that, he ran the retail business at Barclays and he was a senior executive at Citigroup, in the cards business. Antony set up 10X as he believes banking is broken.

#### About 10X Future Technologies

10X Future Technologies aims to transform banking with its next-generation cloud-native technology platform. At 10X they use 10X SuperCore to enable their clients to engage their customers with more timely, relevant, and personalized experiences when it comes to managing money.

#### **Q: What problems did you aim to solve by setting up 10X Future Technologies after working in the banking industry for a very long time?**

I have often described banks as being museums of technology. Throughout my banking career and beyond, I have wondered why banks don't work better for their customers and why doesn't technology create true transformation in financial services?

As I began to work on that problem and thinking about the other themes that had dominated my career, it became clear to me that one of the real impediments to banks being able to deliver what their customers want and what they need for their own shareholders is technology.

Most large financial institutions have many generations of hardware and software within them, and they are generally organized around products — so there will be a separate system for loans, a separate system for current account, separate system for savings and so on. These systems are not interconnected which makes it very difficult for them to be effective in today's world.

So I wanted to create a new platform to deliver banking services in a way that's 10 times better than the traditional method of doing things — 10 times better for the bank, 10 times better for its customers, and crucially 10 times better for society — and for that we have built the world's first cloud-native platform to support banking.

#### **Q: Could we dig a little bit further into what is cloud-native? And then elaborate more on how the propositions built by 10X are different from those offered by existing and often large technology vendors?**

There is a big distinction between cloud and cloud-native. Cloud-native is using capabilities developed specifically for the cloud that give you faster ways to develop code, better ways to test it, and better ways to deploy it. This cloud-native technology is what we have used to solve the problem I described earlier.

At 10X, we've built something called the 'SuperCore', which is an architecture that is totally agnostic to product and allows a customer's data to appear only once on our system, so that you don't get the duplication or fragmentation, I described before.

We have also built in many other features that as professionals in the industry, we wished we had when we were working at big banks, like the ability for non-technical people to actually build product and deploy it directly into the system.

**Q: Would it be correct to say that with '10X SuperCore' you are fundamentally looking at replacing the existing tech stack at banks?**

Yes, pretty much. However, we recognize that for any bank to embark on a technology replacement program, it is regarded as being very risky, expensive, and time-consuming. As a result, banks have traditionally stayed away from replacing large parts of their legacy estate.

By using the new technology at disposal, it is possible to massively de-risk the time, cost, and complexity of transformation projects. What we offer to our clients is the ability to take the 10X platform, build a use-case upon it and that use-case might be an individual customer segment, an individual geographic market, or an individual product line built on the 10X platform. Once that use-case is operative the client can deploy our technology across other parts of their business and ultimately across the entire enterprise.

**Q: Can you explain, in the existing paradigm, what makes these technology transformations so complex, both in cost and managerial terms?**

I believe product migration is the challenge when a bank undergoes transformation. When you look at older banks, there will often be hundreds of product variants in the back book even if banks today usually only market 10 or 20 variants of any given product. So you have to make choices about the product portfolio and decide which customers to migrate to which products.

Building the same type of functionality on a different platform has been another challenge because it is very difficult and time-consuming owing to the inflexibility inherent in the old technology.

On the contrary, our technology is highly flexible. We use micro services. These are small pieces of software code performing unique functions. For example: charging a fee, changing an address, changing an interest rate etc. Because we can assemble those micro services highly flexibly, it significantly reduces the time it takes to build new products on the new platform.

**Q: Where do you think the banking industry is in its journey of technological transformation?**

My view is that we are still at the beginning of the beginning of the transformation and it is early days. However, if I were to think back two years, banks would acknowledge that they had challenges around technology, but they would talk about things like how do we deploy mobile banking applications, how do we use big data, how do we deal with cyber security, etc.

Now what I have noticed is that this has really become a strategic topic for some banks. I would not say all banks, but for some banks. We are approached probably once a week by a bank from around the world that is now starting to think about how to address these challenges.

**Q: How would you differentiate the winners and losers of this transformation? How would you identify banks that can make themselves future proof?**

I would assess if the technology issue is addressed strategically by the bank, or is it simply seen as a functional issue. Now the other thing to unpack is when people talk about their technology strategy there are many things people do which are quite tactical. As I described before, you have these fragmented systems and sometimes you have to get data out of one system and into another. A classic example is name and address. Most banks have created some kind of portal or some – somewhere in the app where you can go and change your address and move from house A to house B. Because of this fragmentation of systems inside the bank, updating that across the databases is often not an automated process.

**Q: What does the bank of the future look like, in say 2025 or 2030 compared to the bank you worked at in Barclays? How different is it? I think your strap line is making banking 10X better for banks as well as for customers. So what does a 10X better bank look like in 2030?**

First I think about this in phases. As I said before, we are at the beginning of the beginning. My view is in the next three years, you're going to see banks gearing up on use cases on these types of technology. In a three to five to seven-year timeframe, you're going to see material migrations of parts of bank businesses onto this new technology.

By 2030, I think you'll see some banks that have substantially moved into this new world. It means that banks will be able to operate with fewer people. If you look at an average bank and ask them how many people work in operations and technology? It's close to 20,000 - 40,000 people. It can be more than 50% of the workforce are doing something called operations and technology.

In a 2030 banking world, you probably need 10% of those people. Similarly, in data and analytics where a large number of people are just taking data out of the systems, cleaning it up, parsing it etc., a lot of that work will go away.

So in my view, you could certainly see a large bank running with somewhere around 30% to 50% less people from what it has today and I think you could do the math on the cost income ratio. On the cost-income ratio, I think it will go into 30% area and even below 30% depending on the business. You can then extrapolate that what that does for return on equity (RoE). I would expect it to be in mid-teens or so.

**Q: Do you believe that cost reduction from workforce reduction leading to RoE's going above cost of capital will be the end-story and there won't be other costs which will shoot up like technology spends or that will rationalize with large systems getting replaced by modular next-gen systems?**

There is obviously going to be a shift towards these newer technologies. These newer technologies are orders of magnitude, cheaper to develop on, and easier to operate. Therefore, tech spending will probably come down over time because you are investing less and less in maintaining these highly inefficient legacy systems.

There is an enormous economic opportunity for the banks that embrace these technologies. If a bank outsources a chunk of its technology to us, we are employing people but the number of people we'll employ versus what the bank would employee would be very much less.

**Q: You are looking to make banking 10X better for clients. So what is the banking experience in this mythical 2030 world for clients?**

Let me give you a framework as to how I think about it. Banks only do six things. They make and receive payments. They borrow and lend. They provide risk management services, often in the form of insurance. And they provide information to their customers on all of those things.

If I take those six things on one hand and then think about the fact that if you look at consumer markets, 30% to 40% of people in developed societies have no money and they have very basic transactional banking needs. Another 30% to 40% of people have very little money. Then the remaining 20% consists of people who have some money, the mass affluent, the high net worth individuals, and then ultra-high net worth at the end of the spectrum.

In that stratification, people at the end of the spectrum, have a lot of money, so they probably still will want to deal with a human being. For everybody else, most of their financial needs, across the six things I described, can be automated and they can be automated, in a way which is much more intuitive for the customer than the way things work today.

I've written elsewhere about how you could imagine a world in which the consumer has an artificial intelligence powered tool that basically monitors their financial lives, shops for the best deal whether it's for mortgage, credit card, loan or savings product and then automatically provisions for that. This way, you take away a lot of the administrative burden and stress that people experience around finances.

I think these kinds of processes, where you have artificial intelligence agents always running in the background of your life, and overseeing your finances like a sentinel, is the thing that will be very attractive to customers.

**Q: We talked about costs going down, client experiences getting better. Can you draw a picture of the revenue side of incumbent banks between now and 2030: How much of the banking revenue pool will get disrupted?**

It is hard to predict but we do have some analogies in industries like the credit card business, where traditionally people have done co-branded credit cards. Some of these are with store cards; some of them are co-branded cards. A lot of them were in the airline space and so on.

The revenue share type arrangements are there but somewhere between 10% and 30% of revenue is shared with the person who has the customer relationship. That's not inconceivable to me. If you're having to share 10% to 30% of your revenue, then you'd better be hyper-effective in terms of how you run your business because you're not going to be able to drive your cost income ratio down or get your ROE up if you don't do that.

## Modeling the 10x Upside and Downside

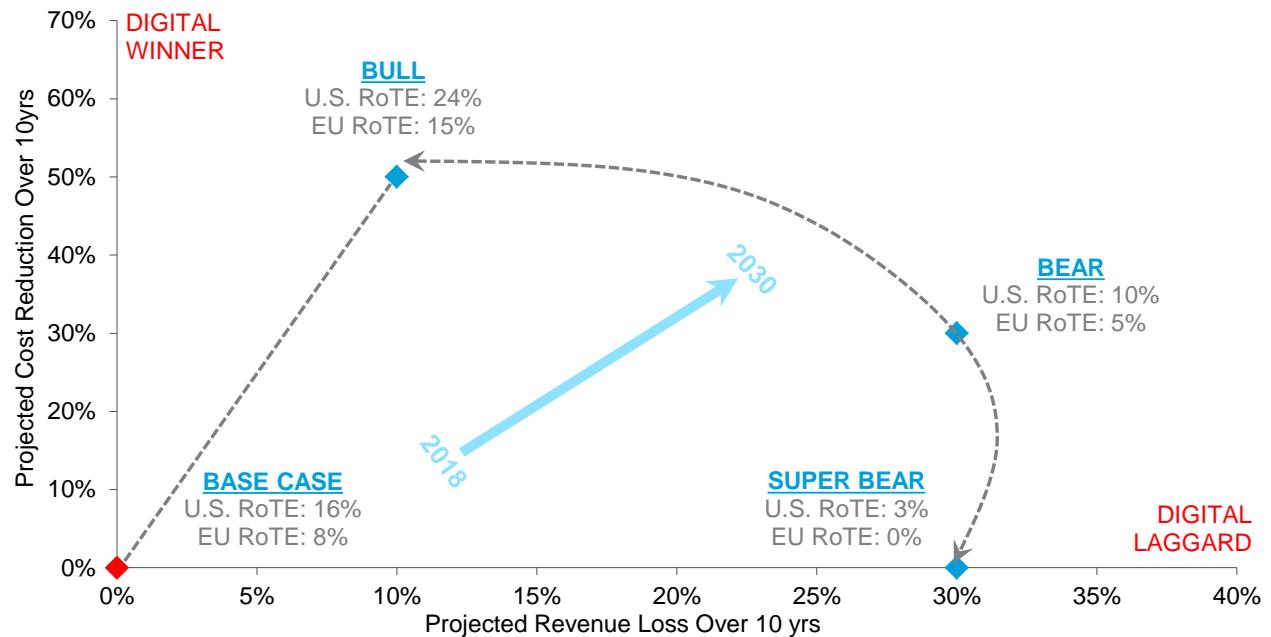
Antony's rallying cry of banking services "10x better" is easy to imagine. Remember our ex-colleague Jane who took a month to get her credit card in Hong Kong? New banks can onboard clients in the U.K. in a few minutes. Given how slow and bureaucratic client experience is in banking, ten-fold improvements here are very feasible.

As Antony sets out in his Q&A earlier in this section, reengineering banks could lead to cost saves of 30-50% for large banks over time. However, we would caution that revenues may also be lost from new entrants and increased competition due to increased transparency and the deflationary impact of technology in general.

Figure 7 illustrates the potential impact of digital disruption on the banking sector over the next decade under scenarios where there were cost savings of 30-50% and revenue loss in the 10-30% range. We model these changes relative to a base line growth of revenues and costs in-line with nominal GDP growth.

Working through the math indicates cost-income ratios would fall from around 60 percentage points today to the mid-30s under the 'Bull Case' scenario and RoTEs would rise to the mid-teens (European banks) and to nearly 25 percentage points (for U.S. banks). By contrast, the 'Bear Case' scenario could see cost-income ratios remain unchanged but RoTE's drop to mid/high-single digit levels.

Figure 7. Projected Cost / Revenue Reduction from Digital Disruption Over Next 10 Years



	Cost-Income Ratio (CIR)				Return on Tangible Equity (RoTE)			
	Bull	Base	Bear	Super Bear	Bull	Base	Bear	Super Bear
U.S. banks	33%	60%	60%	85%	24%	16%	10%	3%
EU banks	36%	64%	64%	91%	15%	8%	5%	0%

Notes: (1) Sector numbers represent aggregate of banks under Citi Research coverage. (2) Base case 2030 RoTE and CIR calculated by applying 3% and 4% compound annual growth rates (CAGR) on 2018 European/U.S. bank aggregates respectively. Our Bull scenario is derived by applying a 10% revenue loss and 50% cost reduction over 2030 base case; Bear case assumes 30% revenue loss and 30% cost reduction; while Super Bear case assumes 30% revenue loss and 0% cost reduction. These are directional estimates and should not be treated as a point estimate but rather help illustrate the profitability upside and risks from disruption.

Source: Citi Research

For European banks, the Bear case forecast of a revenue decline of 30% from digital disruption would be very damaging even if accompanied by cost saves of the same magnitude. In this scenario, profitability, as measured by return on tangible equity, would drop from the current 9% to a mere 5%.

A wide range of outcomes may play out and in the tables below we set out different scenarios for profitability based on revenue losses between 10 and 30 percent and cost reductions of 0 to 50 percent. This is calculated as a divergence from a base line forecast of revenue and cost growth in line with nominal GDP.

**Figure 8. European Banks – 2030E RoTE Sensitivity to Projected Cost/Revenue Reduction**

2030E RoTE	Revenue Loss					Delta from 2030E base case RoTE	Revenue Loss				
	10%	15%	20%	25%	30%		10%	15%	20%	25%	30%
Cost Reduction	50%	15%	13%	12%	10%	9%	+6%	+5%	+3%	+2%	+1%
	40%	13%	12%	10%	9%	7%	+4%	+3%	+2%	+0%	-1%
	30%	11%	10%	8%	7%	5%	+3%	+1%	-0%	-2%	-3%
	20%	9%	8%	6%	5%	4%	+1%	-1%	-2%	-3%	-5%
	10%	7%	6%	5%	3%	2%	-1%	-2%	-4%	-5%	-7%
	0%	6%	4%	3%	1%	0%	-3%	-4%	-6%	-7%	-9%

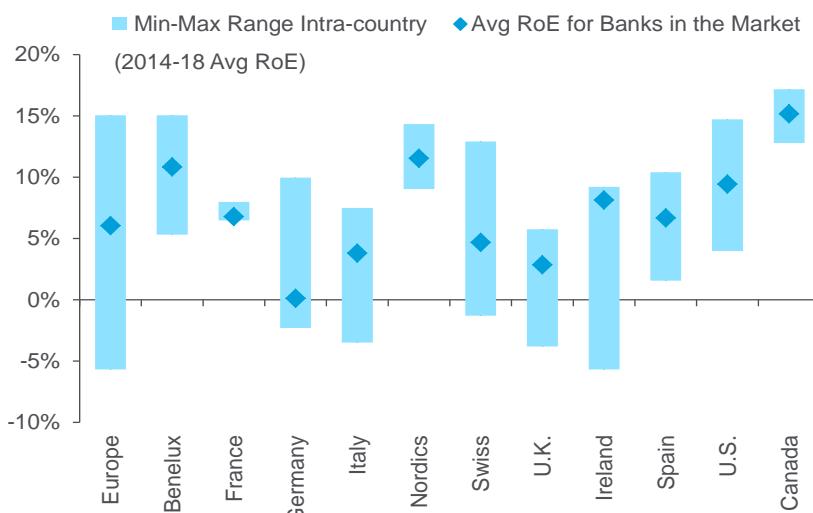
Note: (1) Sector RoTE represent aggregate of banks under coverage. (2) Base case 2030 RoTE derived by applying 3% compound annual growth rate (CAGR) on 2018 aggregates. Above sensitivity analysis is based on variance from the baseline.

Source: Citi Research

Profitability dispersion is already large between banks and the intra-country dispersion is greater than the inter-country variance. Digital disruption, in both positive and negative terms, will likely further accentuate this dispersion with the winners boosting their ROEs and the laggards falling further behind.

Size is an important differentiator in profitability terms. The low or negative RoE generating banks are roughly 10 times larger in market capitalization compared to the banks on the opposite end of this comparison spectrum. Post the global financial crisis, large banks appear to face greater costs and complexities, including regulatory.

**Figure 9. Europe and North America Banks Return on Equity Dispersion**



Note: RoE dispersion calculated bottom up for banks under Citi Research coverage on 2014-18 average RoE's.  
Source: Company reports, Citi Research

## Disruption Risk – Where Do Revenues Go?

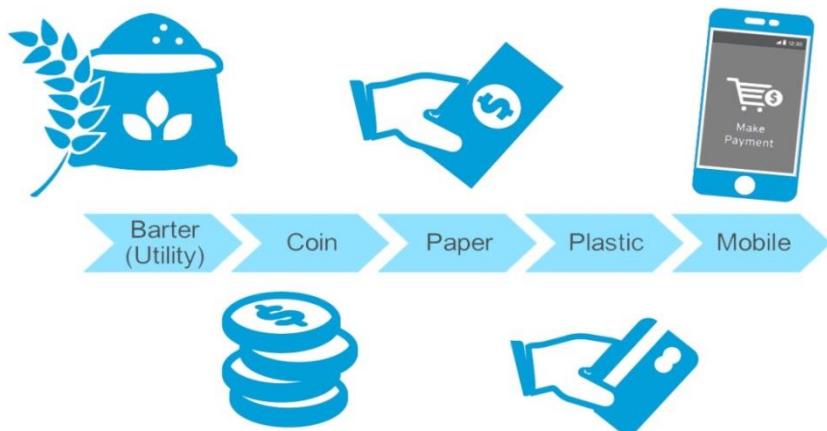
Paper money was invented by the Chinese, initially starting as promissory notes during the Tang Dynasty (618-907 AD) and evolving to State-issued paper money during the Song Dynasty (~1100s), which was backed by silver or gold. By the time of Kublai Khan (1260-1294), paper money was no longer backed by precious metal.

Money was already well on the road to becoming virtual. Just as paper money was invented in China, the digital money revolution has been scaled most successfully in China. Over the past decade, the mobile revolution coincided with urbanization, e-commerce, and a rising middle class in China.

The largest mobile money institutions in the world are now Alipay (Ant Financial) and WeChatPay (Tencent) with nearly a billion active users each. Having started in payments, many new entrants such as the Chinese Internet giants have moved into adjacent financial services including savings and lending products.

In other parts of Asia and Africa, telecom and increasingly transportation companies have moved into financial services. In Europe and the U.S., we have not seen a similar emergence of SuperApps or Platform companies invading finance, but new product-focused challenger brands and FinTechs have emerged.

**Figure 10. Evolution of Money**



Source: Citi Research

The revenue impact from digital is from at least two sources:

5. Digital in general creates more transparency and (regulator permitting) increased competition.
6. The competition is from platform companies that may be willing to cross-subsidize financial products with their core (non-financial) products and/or do not have near-term profitability key performance indicators (KPIs) similar to incumbent banks.

At a product level, payments and investments are expected to be most impacted by 'disruptive business models' from BigTech, FinTech, and neo-bank players (the latter can include challenger propositions set up by incumbents as well). Between one-third and one-half of all consumer payment volumes may be lost by incumbent models.

Figure 11. Estimated Volume Lost to Disruptive Models by 2025

	North America	Europe	China	Developed Asia	Emerging Asia
<b>Payments</b>	6% 34%	6% 34%	9% 50%	6% 34%	2% 36%
<b>Investments</b>	6% 34%	6% 34%	9% 50%	6% 34%	2% 36%
<b>Personal Lending</b>	6% 34%	2% 17%	6% 34%	2% 17%	1% 24%
<b>Credit Card Lending</b>	2% 17%	2% 17%	2% 28%	2% 17%	1% 24%
<b>SME Lending</b>	6% 34%	6% 34%	2% 28%	2% 17%	2% 36%
<b>Mortgage</b>	6% 34%	2% 17%	1% 14%	2% 17%	0% 12%

2016      2025      Critical disruption by 2025      High disruption by 2025      Medium disruption by 2025      Low disruption by 2025

\* Disruptive models vary across product – Investments: low price, digital-only brokerage and robo-advisor; Mortgages: digital-only robo-mortgage, new credit scoring; Personal, credit card, and SME lending: digital only, P2P marketplace; Payments: digital payment via wallets; peer-to-peer (P2P) or account-to-account (A2A) and digital only cross-currency exchange.

Source: Citi Global Digital Strategy, "Bang and Fuse" model, Citi Research

While we expect the disruption revolution to start in payments, we expect it to widen out to other financial products. The tipping point for incumbent banks is if their core businesses of savings and loans are impacted.

A dissection of global banks' profits by product shows that lending accounts for over 50% of the banks' total risk-adjusted revenues, followed by savings and investments (21%), capital markets (16%), and payments (7%). Personal/SME is the most profitable segment for banks, accounting for nearly half of all profits, followed by corporate (35%), and investment banking / markets (~20%).

Figure 12. Global Banks Profit Breakdown By Product and Customer Segments

	Payments	Savings and Investment	Lending	Capital Markets	Overall
<b>Personal/SME</b>	4%	12%	29%	1%	46%
<b>Corporate</b>	3%	6%	21%	5%	35%
<b>IB/Markets</b>	0%	3%	6%	10%	19%
<b>Overall</b>	7%	21%	56%	16%	100%

Source: Citi Research

## Changing the Operational Model, Reducing Costs

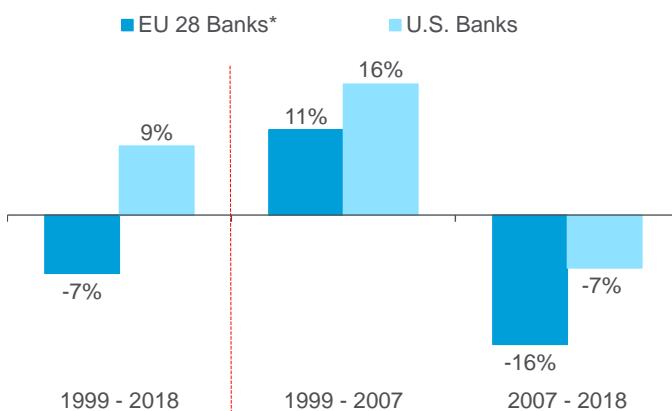
In financial terms, ten-fold improvements are unlikely overall – albeit individual projects may be run at significantly lower budgets than traditional bank IT projects. As David Brear, CEO of 11:FS notes, when partnering with banks to build new businesses they are using a ‘start up mentality’ — small teams, move fast, spend small.

Challenger banks are typically run with a few hundred employees. Incumbent banks are often run with a hundred thousand employees. Bank staffing levels peaked in the decade preceding the 2008 crisis, when both the European and the U.S. banks saw the number of full-time employees (FTE) increase 11% and 16% respectively.

Following the financial crisis, as banks focused on cost optimizations and invested in technology to automate processes, the number of banking sector FTE has gradually declined in the 7-16% range. At the same time, while staff numbers have declined, ‘support staff’ numbers are up.

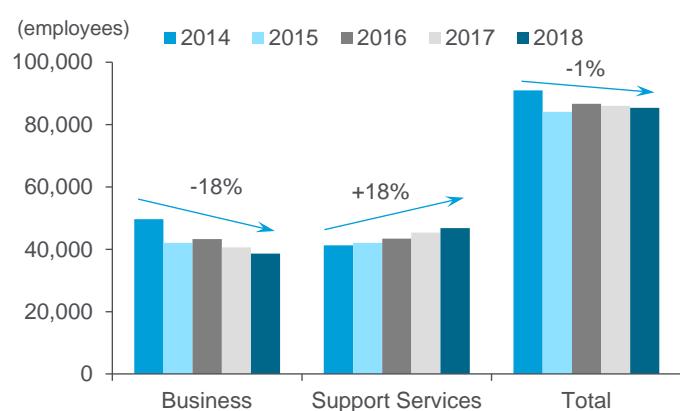
Standard Chartered is a good example of the trend at international banks: they have reported an 18% increase in support service staff over the last five years, comprising nearly 55% of total FTE. By contrast, ‘business’ FTEs were down almost 20% in the same period.

**Figure 13. Change in Banking Sector Full-Time Employees, 1999-2018**



Source: ECB, FDIC, DataStream, Citi Research

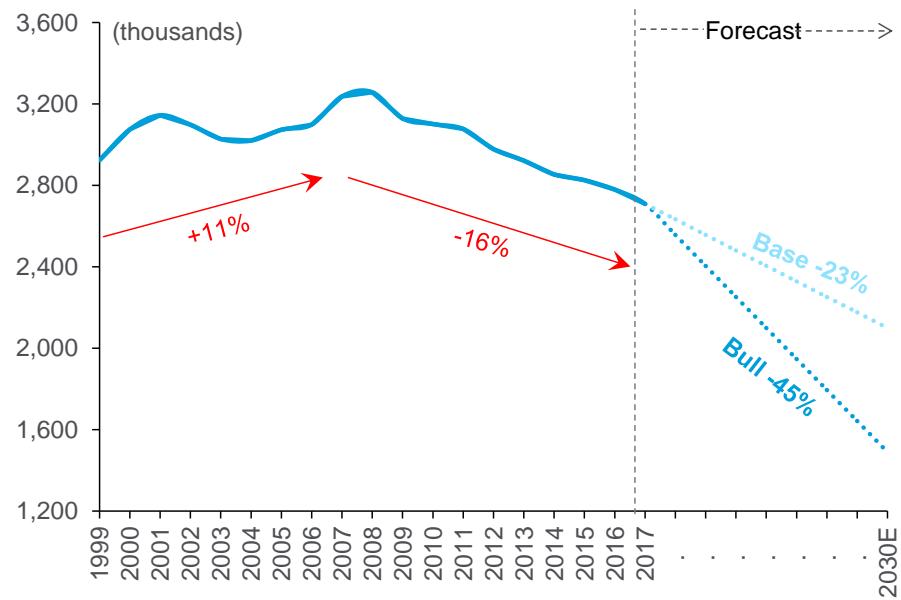
**Figure 14. Standard Chartered: Change in Employee Mix, 2014-2018**



Source: Company reports, Citi Research

In general, operations and technology comprise the biggest share of total FTE in any bank, as high as nearly 50% for large banks. While in the near-term, technology costs and FTE could increase as banks invest in system upgrades and compliance-related expenditure, it is possible that longer-term spending and staff numbers decline as the newer technology is less expensive to maintain.

As Antony Jenkins sets out in his Q&A earlier in this chapter, in his view the Bank of the Future is likely to see operation and technology FTE reduced to just 10% of its current strength. This translates to a Bull scenario of a 45% reduction in total FTE from current levels. In contrast, even a more conservative restructuring scenario, where operations and technology staff are reduced to half of current levels, suggests an over 20% decline in total FTE.

**Figure 15. European Banks – Full-Time Employees**

Note: Data for EU28 banking sector sourced from ECB. 2017-30 values represent Citi Research estimates

Source: ECB, Citi Research Estimates

## Innovation at an Incumbent

### Interview with Vanessa Colella of Citi Ventures:

**Vanessa Colella** is Citi's Chief Innovation Officer (CIO) and Head of Citi Ventures. Before assuming the role of CIO, Vanessa led venture investing and D10X for Citi Ventures, and previously ran marketing for Citi's North American Consumer Bank. She joined Citibank in 2010 from U.S. Venture Partners (USVP), where she was an entrepreneur-in-residence. Prior to USVP, Vanessa was Head of NA Marketing and then SVP of Insights at Yahoo, where she was responsible for developing and executing the company's consumer data strategy. She was previously a Partner at McKinsey & Company and a high school Biology teacher.

#### About Citi Ventures

Citi Ventures makes strategic investments in startups developing solutions across commerce & payments, data, analytics & machine intelligence, financial services/technology, marketing & customer experience, and security/enterprise IT to provide the best and most innovative products and services for clients.

#### Q: When did banks start having CIOs and what is the role of the CIO like at a big bank?

Citi first named a CIO back in 2008 before most companies had this as a defined senior leadership role. Today, roughly 63% of companies have an appointed CIO. That said, innovation is not one person's job. Innovation is happening all across the company and Citi Ventures is deeply embedded with the business units to help accelerate growth.

I believe the CIO should focus on setting a clear vision and strategy for innovation, supporting the innovators within the company and helping to build bridges with external partners to bring the outside perspective in.

Rapid changes in technology, client expectations, and customer behavior have accelerated the need for continuous innovation. Companies used to approach innovation in phases — now innovation is a constant part of product development. At Citi, we are looking at signals not just in our 'defined' markets but in the broader ecosystem. We're looking for new ways to solve problems directly with clients and create new economic opportunities.

#### Q: What are the differences in innovation in a regulated industry like a bank versus other sectors such as tech or telecom?

We're focused on 'smart' acceleration. In a regulated industry that depends on predictability, reliability, and repeatability — we have to find a scaled, systemized, and safe way for employees to validate and incubate their ideas.

The process of innovation has changed significantly over the last decade. Innovation is not new, but the competition is broader and banks have had to adapt to the new pace. This means innovation teams and risk teams partnering early on to drive the best solutions. From my perspective, our risk teams are our first 'beta testers' and their advice and counsel is a helpful steer.

At the end of the day, we manage capital flow around the world. While accelerating the pace is increasingly important, being smart about how we are innovating is tantamount.

**Q: How do we de-risk innovation at Citi and how do we distinguish it from not doing any innovation at all?**

Innovation is a team sport. You can never completely de-risk innovation but as mentioned earlier, there is a way to automate the process so the whole team is onboard and the end result is the most desirable outcome.

D10X is our internal growth model. Grounded in the principles of venture capital and lean startup methodology, this global program encourages internal entrepreneurship by empowering Citi employees to build, test, and launch new solutions that are ten times better for our clients. It's more than just a new program — it's a way of teaching new thinking across the entire organization.

**Q: Can you highlight some examples of internal innovation? How does Citi Ventures work with internal and external partners to encourage and catalyze innovation?**

We welcome what's next. New technologies are opening up new economic horizons and delivering smarter solutions for clients. We are reinventing the innovation 'process'. Few examples of our work are:

- **D10X:** Since the program's inception in 2016 over 2,500 employees have been involved with D10X, with nearly 100 internal startup ideas currently in various stages of development. This is a collaborative effort, with employees from all areas across the business coming to D10X with their ideas.
- **Proxymity:** A new digital proxy voting platform for corporate shareholders that was conceived and developed through D10X and built in the Citi Innovation Lab in Tel Aviv. Following a successful production pilot, Proxymity was rolled out in June 2018.
- **Pitch in the Dark:** Citi Ventures recently hosted an event "Pitch in the Dark," in Israel, which focused on highlighting how much preconceived notions weigh into our decision-making process. Entrepreneurs pitched judges in a completely dark room, so appearance did not play into whether or not he or she moved forward. While these efforts are not perfect solutions, they provide a pathway for investors to notice bias and see how it plays into reasons they make decisions.
- **(University) CUPID:** Students are working on innovation projects across the bank involving machine learning, natural language processing, and data analytics. 850 students from 22 universities have participated in a little over a year with 61% of participating students pursuing non-business degrees such as design, engineering, and political science.
- **Startups:** Citi Ventures meets with more than 1,000 startups annually, introduces more than 50 startups to Citi's businesses, and invests in 15-20 startups each year. We have participated in nearly 70 total investments (20 in 2018 including follow on investments) in more than five countries, and have had 17 exits (4 in 2018 including Clarity Money, Chain, Joist and Cylance).
- **HighRadius:** Citi invested in and partnered with HighRadius to use automation and artificial intelligence to bridge the gap between accounts payable and accounts receivable in B2B payments. Following our investment we announced in July 2018 a strategic partnership with HighRadius to launch Citi® Smart Match, which leverages HighRadius' AI and ML technology along with Citi's own assets. This partnership helps Citi automate manually intensive processes, reduce costs and optimize working capital.

■ **Associate mortgage program:** grew from recognition of a customer pain point, particularly in the U.S. Many young professionals join the workforce with a lot of student debt. Some of them take 20+ years to pay this debt off. We realized that burden of paying off student debt and starting a family and buying a house was a challenge. The Associate mortgage program is a hybrid product which helps young professionals to pay-off their student loans quickly and allows them entry in home ownership.

**Q: How important do you think talent is in the entire process of innovation and delivery of this innovation to clients?**

Talent is an important component of any company. Everyone is vying for the best and brightest talent globally and it's critical to understand what your company can offer that is unique and stands out from the pack. Bundling 'perks' or allowing employees to wear jeans is not what will change a culture. It's a comprehensive review of how we work, the opportunities we give our employees, and helping them to build a dynamic long-term career that enables them to live the life they want.

Ultimately, we believe that diversity creates friction which accelerates innovation. Diversity is not just limited to gender diversity. We strive to include as much diversity as we can in our teams. This can include experience diversity which helps to leverage different and deep experiences across the industry and deliver best in class products for our clients. Work and industry used to be like swimming in your lane – now it is like playing water polo. We need flexible, diverse teams to compete.

# On Building Challenger Banks: Independently and for Incumbents

## Interview with Megan Caywood:

**Megan Caywood** is Managing Director, Head of Digital Strategy at Barclays. Before joining Barclays in early 2019, Megan served as Chief Platform Officer for Starling Bank, a technology company with a banking license that is looking to disrupt finance.

### About Barclays

Barclays plc is a British multinational financial services company headquartered in London. Its core markets are the U.K., where it offers universal banking, and the U.S. where it provides investment banking and consumer credit products.

#### **Q: Why do you think U.K. has an explosion of challenger banks – quite contrary to US and Europe?**

After the global financial crisis, the U.K. went in a different direction versus the U.S. when it comes to banking license terms. U.S. regulators stopped giving banking licenses whereas the U.K. wanted to increase competition in banking and therefore made regulations for issuing banking licenses simple. Recently, we have seen the establishment of new digital banks in the U.K. such as Tandem, Starling, Monzo, and Atom; as well as other payment services banks such as Clearbank and I believe that regulatory environment was the key catalyst in shaping up the industry the way it has.

#### **Q: Why have banks such as Monzo, Starling etc. expanded rapidly? Is there a missing piece in the banking service that they are helping to solve?**

The new challenger banks have stepped up to solve many of the problems customers at traditional banks faced. There was a sharp drop in tech/digital investments after the global financial crisis and many of the challenger banks picked up from there and focused on different directions/segments.

Monzo launched early with a pre-paid card offering to start testing their product and getting early user feedback, and had good success building an engaged consumer base that way prior to launching their full retail bank offering. Tandem initially struggled to get a banking license due to capital constraints and it therefore ended up acquiring another bank and subsequently launched their challenger offering focused on credit cards and differentiating within that space. Atom on the other hand launched a mortgage product, whereas Starling launched a mobile-only consumer and business accounts, and simultaneously invested in building a full set of APIs (significantly ahead of the Revised Payment Service Directive, PSD2) and started monetizing the APIs (i.e. payment services and banking as a service).

#### **Q: How crucial is the role of APIs (Application Programming Interface)?**

APIs are like a plug between the product and software. In recent years, it has revolutionized the system. APIs enable FinTechs to compete more effectively with traditional banks, especially with PSD2, where users can share APIs with other financial institutions based on their discretion, which was previously not allowed.

**Q: What benefits and pitfalls do you see in the plan where RBS is partnering with Starling in consumer banking?**

It was like Uber partnering with Google for a good navigation system instead of developing its own GPS. RBS wanted a new digital offering, rather than reinvent the wheel and Starling had best in class technology which was built from scratch. Hence RBS decided to get into Starling and use their payment APIs.

**Q: Why are banks looking to hire senior staff from FinTech companies?**

It's a difficult time for traditional banks given new challengers on the block, technology companies coming to market, digitization etc. and you have regulations that support this competition (in the U.K.). So banks are seeing this as the moment to change and gain momentum by hiring some of the talent from competitors.

**Q: When was the tipping point after which banks felt that they could no longer ignore FinTech?**

If we look a few years back, there was heavy skepticism within the banking industry related to the FinTech boom. Gradually, a lot of banks saw the threat at their doorstep and started paddling the boat towards digitization etc. However, large parts of banks did not focus on tech and innovation but focused on how they can keep disruption at bay. Instead of asking questions like how can they innovate and improve customer experiences, they still ask how we can avoid this disruption.

**Q: Should incumbent banks set up their own digital bank?**

It is a progressive move to invest in your own digital bank. Although the idea is a good one, the execution has to be equally good. For example, Mettle by RBS — the prepaid card solution — is an example of how one can innovate on the front-end, but there is still a lot to be gained at back-end as well. They deliver the pin required for a new account by postal mail. Focusing only on the front-end is the biggest challenge banks face. Not innovating back-end processes is more like putting lipstick on a pig.

**Q: Tech-giants like Amazon are in payments and SME finance. How far are these players from getting big in more broad-based banking (e.g., checking accounts)? What will that do to markets?**

Lots of banks are afraid of GAFA (Google, Amazon, Facebook, Apple) getting into banking. But the reality is that GAFA will compete more on financial products rather than become a broad-based bank. With PSD2, banks are increasingly at risk of becoming mere tubes in the banking process where the front-end products are with GAFA and the back-end processes are with traditional banks.

Banks also face challenges from GAFA as they are in a better position to cross-subsidize their products. For example, Amazon can issue a loan product at cheap rates and compete with banks, all the while making a loss as it can cross-subsidize it with their e-commerce site. Cross-subsidizing for banks is rather difficult as finance is their core product — of course they can cross-subsidize inside finance.

But banks are right to worry about the GAFA as they have strong brand recognition and brand recall which means customers are likely to put their money with them if they started offering banking products.

**Q: What is a platform company and can a bank become a platform company?**

Ordinarily, a platform company refers to a scenario where one is creating a tech platform to connect two sides of a market, say, to connect to the producers and to the consumers. Like any market, if one side grows, it surely benefits the other side. Within banking there are two types of platform companies: (1) banking as a service (platform-ication of banking, i.e., looking at the API side, so that their services can be consumed externally by third parties); and (2) integrating your banking into other apps. I think the second type is the more difficult variant.

## Build What You Need, Don't Extend What You Have

### Interview with Leda Glyptis of 11:FS:

**Leda Glyptis** is a lapsed academic and long-term resident of the banking ecosystem, inhabiting both startups and banks over the years. Leda is Chief of Staff at 11:FS and CEO of 11:FS Foundry.

#### About 11:FS Foundry

11:FS has several business areas that aim to help financial services institutions manage their journey towards digitization. One of those areas is Foundry. Foundry tries to solve the question of how do you produce digitally native propositions, not tweaked to what you have but something that is designed to be a native experience, and a native delivery mechanism that can both scale and retain agility. Foundry is working with DNB on upgrading their unsecured credit platform at present.

#### **Q: Can you define digital transformation for us? What is the digital bank of the future and how will it be different?**

Digital transformation is not about technology. It's about doing everything differently for the first time. It is mostly about updating and future-proofing what we have. The urgency and creativity around those transformations tends to be fueled by what challengers and new entrants are doing in their geography.

For instance, banks in the U.K. where we are seeing a lot of activity from all players tend to feel that their digital transformation initiative is not just about digitizing what they have, but also creating a competitive edge against what the new kids on the block are doing.

Meanwhile, in geographies where activity from new entrants and challengers is lower, we're seeing the digital transformation agenda being driven more by regulatory requirements.

#### **Q. How much change is enough change while digitally transforming an organization that has been there for decades?**

When we're looking at digital transformation, one of the big unasked questions is does our organization realize that we might need to change the organization structure; we might need to change the support function, the operations, the system etc. It's scary that this question is not raised in its totality.

The digital bank of the future will be radically different because banks start a transformation with 'how much of my existing infrastructure can I take with me?' rather than starting with 'what does a client need and how can I help them get to it?' You end up in a very different place from a product simplicity perspective, from a user journey perspective, and from an associated infrastructure perspective if you think for the customers.

The reality is banking at all levels is a "so-that" business. You don't engage with your bank for fun, either in retail business banking or actually institutional and investment banking, there's always an end-game: living your life, growing your business, funding infrastructure projects, allowing a big corporate or sovereign to carry on with the business of delivering against what it is it does.

Traditional banks are not designed to think like that or deliver like that. So, what do I mean when I say it will be radically different? It will be less about us as institutions and more about what the customer is trying to do and how we can get out of their way and deliver value in diminishing that interaction.

**Q. How far are the banks in their journey to believing that they need to transform the operating model and the organization structure?**

Well some banks we have spoken to say that it doesn't apply to their business, they are an investment bank for example, or it doesn't apply to their market etc. There's always a reason why it doesn't apply to people and it seems like the conversation hasn't changed dramatically over the last ten years, and yet it has.

I find that over the last 10 to 15 years people are trying to find reasons why this avalanche of change might not completely hit them face on. I understand that from a human perspective, from a risk management perspective, from an organizational perspective.

Doubting that the change applies to you is valid, denying the evidence that we see, is not. I was part of this digitization journey from the beginning and have seen it unfold and grow, but someone who was scared about digital 8-9 years ago would be terrified today just by the sheer volume of stuff happening.

**Q. How does 11:FS help banks to cope with digital transformation. What do incumbents need to do to win the journey?**

There are two things that a big bank has to do. First is to accept that there is no easy option. Opening an innovation center and letting that run is not enough. Some bold decisions have to be made for genuine business to be channeled through those solutions; otherwise they are nothing but experiments.

The technology comes last. In fact, the technology components are things that the banks already use; it's the architecture that's different and it's the deployment that's different.

The second thing they have to do is take a very long, hard look at themselves and draw a line between what represents a genuine asset for the future versus habit or legacy. The customer base, the trust of those customers, all the regulatory approvals, the distribution are all assets but they're not assets in their entirety; there's quite a lot of habitual and legacy stuff wrapped around them.

**Q. Can you define a core banking system and what underlying technology stacks can be changed?**

So, a core banking system is the sort of engine underlying quite a lot of your basic functionality. It's where the various bits of your bank connect up. It's where a lot of the transactions flow, a lot of the ledgers flow, where a lot of the information gets tallied up and then redistributed. The technology part is the easier part.

The difficulty is the business decision and the politics around moving away from some systems. And that's not to diminish the complexity of the technology, but if a startup of three kids in a garage can build an infrastructure that runs at scale, then it's not a technical problem, it's a business problem.

If I need to do something that touches my core banking system, and my core banking system is limited because it was designed to solve different kinds of problems, what do I do traditionally? I go to the person who provided my core banking system and ask them to do better.

But it takes 5 years to replace the older huge version with a new version which is equally huge. What is problematic about the timeline is five years in today's technology advancement is an unfathomable long time. We have no way of knowing what the world will look like in five years.

So, if you commit to a shape for your infrastructure today, for five years down the line, you will already know that you will be on the back foot. You need your iteration cycles to be faster.

**Q. Can you draw-in the example of your client and partner DNB please? Can an organization take a modular approach in digitization or does it have to go all-in?**

Our client and partner DNB, the biggest bank in Norway, was asking some of these same questions. They wanted to deliver digital propositions at scale, without constantly increasing costs and without maintaining these massive bills. Something has to be done differently. If you always do what you always did, you will always get what you always got.

What we're trying to do with Foundry is to say don't be constrained by what you had, be driven by what you need. There is no need to replace everything if some of it is working, but there's also no need to be constrained by architecture of a time when digital didn't even exist.

If you need to change everything, then change everything. If what you're doing is a Band-Aid you're doing it wrong — you actually need to change everything. It has to be needs-driven.

## On Core Banking Systems

### Interview with Tanya Andreasyan of FinTech Futures:

**Tanya Andreasyan** is the Managing Director and Editor-in-Chief of FinTech Futures, an international FinTech publication. She has an extensive understanding of the banking/financial services technology industry and specializes in covering banking tech, FinTech and PayTech markets.

#### About FinTech Futures

FinTech Futures is a digital publishing platform for the worldwide FinTech community, covering a comprehensive range of areas, including – FinTech, BankingTech, PayTech, RegTech, WealthTech, LendTech, and InsurTech. It also incorporates the Banking Technology magazine, a print and online publication founded in London in 1984, which is a trusted brand for FinTech professionals worldwide.

#### **Q: Can you help us define core banking and also explain why there is so much focus on core banking transformation these days?**

A core banking system (CBS) is a transactional system that enables the bank's customers to carry out transactions and manage their account. Anything that goes into the bank and comes out of the bank in terms of financial transactions goes through a core banking system.

The original CBS dates back to 1960s/1970s and over time these systems have been modernized and updated, but a lot still have their roots and codes from back in the 1960s. Before the financial crisis in the late 2000s, quite a few banks realized how old their systems were and started IT transformation projects. A number of these attracted a lot of attention because they were by big banks like the Big Four in Australia, a number of large players in North America, and also Europe.

Changing a CBS is often compared to performing open-heart surgery. You have to keep the bank alive – you can't shut down the operations and ask your customers to come back in three years' time. You have to continue maintaining the day-to-day activities and at the same time, implement new systems, integrate with other solutions, train all your staff, move all your data from the legacy systems, reconcile everything and make sure all of it works and is compliant. Such projects are extremely expensive, very complex, and can be very lengthy.

Then the financial crisis happened and the attention of all the banks understandably shifted elsewhere. A lot of core banking projects were abandoned or put on indefinite hold and everybody rushed to look at regulations and compliance. Many banks went bankrupt or ran out of money, so they could not afford to continue with these projects.

As banks crept out of the crisis and faced the onset of new technology and ever-evolving regulations, banks again set out on the core software overhaul path.

#### **Q: Who does a big bank need to call if they decide to modify their core banking system? What are their relative strengths and weaknesses?**

If it is a very big bank it is unlikely to go for a full end-to-end overhaul in one go because it is just too risky and difficult. Often, CIOs and CTOs try to avoid this and wait it out until their retirement and then let somebody else take over and manage the project risk.

However, if a big bank is embarking on a major core system transformation, the pool of vendors to choose from is limited. There is Oracle Flexcube, TCS BaNCS, Finacle Infosys, Finastra (which probably everybody still remembers as Misys), SAP, and Temenos.

These are the main players on the international arena that you will be looking at. In the U.S. the picture is different. If you are a domestic bank you have four tech heavyweights: Jack Henry, FIS, Fiserv, and now Finastra as well (what used to be D+H, and Open Solutions before that).

In terms of pros and cons, these vendors really focus on their core banking offerings and invest in them. Especially for Temenos, it is the firm's bread and butter. We can argue that maybe the core banking tech divisions of the likes of Oracle, Finacle, TCS, and SAP are part of much, much larger corporations that have other business lines and products. But they all are experts in their fields.

It is understandably reassuring for banks and financial institutions, when they go to a third-party provider, that they have expertise, live customers, and sufficient resources and partners. In terms of specifics, obviously, it varies from bank to bank and depends on the bank's preferences and requirements. So you will be looking at the underlying technology, you will be looking at what you already have in the bank and see how the proposed system might embed, if and how it will integrate with other solutions that you've got, the resulting complexities, and of course the costs.

Some of these aforementioned technologies might be more costly than others, and some of them might have more expense in terms of, for example, consultants and implementation partners (or the lack of such). One also has to take into consideration the cultural fit, because we all know it does matter. So there is a lot to think about! Therefore, you look out for examples in your market and try to draw conclusions from that.

**Q: What do you think of the new entrants in the core banking software market having meaningful chances to engage with big incumbent banks?**

The new entrants such as 10x Technologies, Thought Machine, Mambu, Leveris etc. are quite small themselves. Therefore, they wouldn't be able to undertake a massive overhaul even if they really wanted to, because they have neither capacity/expertise nor scale at present. Also big banks are highly unlikely to entrust an entire IT transformation involving millions of accounts, clients, and staff to a small startup that has a hundred people on its payroll.

However, what a big bank can consider is working with these firms when setting up new standalone digital offshoots. There is a global trend amongst established players to launch such offshoots for targeting a specific niche, e.g., SMEs or digital-savvy consumers. Such projects are less risky, are quick to market, and quick to bring results. There's RBS/NatWest in the U.K. with an SME-focused challenger brand called Mettle, built with the help of consultancy firms Capco and 11:FS. The bank is also currently working on another mobile banking platform, Bó, aimed at consumers. Also in the U.K., Santander is building a digital banking platform for SMEs with Mambu. In Canada, ATB Financial is launching a new digital banking service called Brightside, and while the bank is a long-standing user of SAP core banking software, it opted for the technology from Technisys, a newcomer to Canadian market, for Brightside instead of SAP's offerings. Meanwhile, Thought Machine is working with Lloyds and 10x Technologies with Nationwide Building Society.

Now on that — for startup vendors, this is a good opportunity as well because they can then grow, develop, and scale their systems further if the demand comes from clients. Like in the case of Mambu, for example: it started as a lending platform for microfinance, but has grown into a lending platform for banks (with impressive names like N26 and Santander on the client list), and the customers now are pushing Mambu to look at deposits, savings, and payments functionality – to become a more fully-fledged core banking system. If you recall, a similar thing happened many years ago with Flexcube – which grew out of Citigroup.

**Q: To put things in perspective, can you please elaborate on what exactly is the pitch of these new vendors?**

Well, the new vendors are likely to be more cost effective compared to their larger, established peers. Another advantage is that they are nimble, quick to respond, and more agile. Moreover, they have more opportunities to be really dedicated to each client, as they have fewer clients compared to large incumbents with, say, 500+ clients.

Another standout point is on the technology front and saying ‘we were built for the modern world, for today and for tomorrow, not for yesterday’. These new tech firms don’t have legacy tech and the associated legacy issues. They have been created cloud-ready, mobile-ready, agile-ready versus the older vendors like that had to adapt their technologies to suit modern requirements.

**Q: How are bank management teams thinking about building CBS in terms of on premise versus cloud-based?**

The cloud is now all the rage and if you look at the regulators, they are a lot more open toward the cloud than they used to be. In the U.K., there are two banks running their core in the cloud — OakNorth with Mambu (on AWS) and Redwood Bank on DPR Consulting (Microsoft Azure) — who are approved by the regulator. Another U.K.-based challenger bank, Clearbank, also has its technology in the cloud. In Australia, startup bank Xinja implemented SAP’s core in the cloud and another startup, Volt, went for Temenos’ T24 system in the cloud.

As for the big banks, when they launch their new offshoots or digital subsidiaries, they too tend to put the technology into the cloud. For instance, Santander’s digital banking subsidiary in Spain, Openbank, is using Temenos’ T24 system in the cloud.

But to move the entire core banking system of a big bank to a cloud is risky due to the size, complexity, and the implications if something goes wrong. I don’t envisage top-tier banks moving the entire core infrastructure into the cloud any time soon. But absolutely, in any boardroom meeting or in any system selection, the cloud, for either a specific functionality or for core banking systems, will be discussed.

The conversations revolve around can it be done in the cloud, what can be done, and how. My expectation is we are talking a few years and then the cloud will be as mainstream as it comes.

**Q: How you think about approaches as to how banks go about overhauling the system – Big Bang versus Modular? And do you think we've seen the end of Big Bang approaches for large banks, and everything is going to be a progressive renovation from here on out?**

I think going modular is a more sensible approach, especially for larger players, because Big Bang is very ambitious and it is very difficult, stressful, and so many things can go wrong. Therefore, “progressive renovation” has its merit and is gentler, more rational, and feasible.

However, the phased roll-out has its disadvantages too. It can drag on for years and you end up paying both providers and maintaining both systems. Just take a look at the example of Suncorp in Australia, where the bank has been paying both CSC for its legacy Hogan system and Oracle for its Oracle Banking Platform system for nearly a decade now.

**Q: When you think about the key to large vendors who could do core banking overhaul, based on your knowledge, who has a very good sales process and whose sales process might lag?**

Well, in terms of the sales process, Temenos stands out as a very strong contender, in my opinion. Its sales process is well-organized and sleek, compared to some of its main rivals.

## Standalone Challenger Banks

### Challenger Banks in the U.K.

In March 2013, the Financial Services Authority (FSA) and the Bank of England published results of their review on the barriers to new entrants in the banking sector. The review set out significant changes to regulatory requirements and authorization processes with the objective of lowering entry barriers and eventually enabling increased competition amongst banks.

In April 2013, the FSA was replaced by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA) and both the FCA and PRA will need to approve new entrants — the PRA for prudential issues and the FCA for conduct.

Changes to prudential regime brought in a major shift in approach to prudential regulation of banking startups. This reflects the PRA's philosophy of regulation, within which the possibility of bank failure should be accepted as a normal market process provided there are clear mechanisms in place to resolve banks smoothly without threatening financial stability.

The changes meant that startups would no longer face additional capital known as add-ons and scalars. These requirements often resulted in initial capital requirements for startups that were higher than that for the existing banks. The change called for reduced liquidity requirements for all new banks and the removal of an automatic new bank liquidity premium.

Meanwhile, changes to the authorization process enabled an applicant firm to apply on a much faster timeline. The aim was for the PRA and FCA to work together to complete all of the assessment and decision making within six months. To support firms to provide a complete application, the PRA and FCA introduced a significant level of up-front support to the applicant firm, during the pre-application stage, including a challenge session. This approach is particularly suited to firms which have the development backing, capital, and infrastructure to allow them to set the bank up at speed.

An additional option for authorization was introduced for firms who could not meet the 6-month timetable because they cannot fund the up-front investment required, or because they have longer lead times in terms of raising capital or setting up the infrastructure. These firms will be able to ask for an alternative, 3-stage route to authorization, specifically:

- The same enhanced pre-application support.
- Shorter application that focuses on essential elements (such as business case, capital, liquidity, and key senior appointments), which, where the information is of the required quality, will be determined within six months.
- Granting an authorization but with a restriction that will enable the firm to then mobilize the remaining requirements such as capital, personnel, IT, and other infrastructure.

## Examining the Banking-as-a-Service Model

Banking as a Service (BaaS) is the concept that basic components of banking services can be modularized in order to deliver customized FinTech use-cases in digital contexts to non-bank entities such as challenger banks, technology providers, marketplaces, merchants/brands, and gig economy platforms via API connectivity.

For classification purposes, BaaS provides third-party access to bank functionality and can be considered a subset of open banking (e.g., general third-party access to banks via APIs). However, BaaS is distinct relative to Open Banking initiatives in the U.K. and PSD2 in the EU, which relate to access to data versus access to white-label banking services.

For example, bank account functionality — including debit cards — for challenger banks is often supported by third-party banks via BaaS platforms in the United States. This can permit agility and more resources to be allocated towards customer-focused innovation versus banking infrastructure, implying a leaner operating model relative to traditional vertically-integrated models.

Figure 16 illustrates the BaaS model “layers”. Note that the BaaS model can be assembled in a number of different variations — support an increasing range of standard and custom use cases for a wide range of consumer, business, and technology applications. BaaS revenue models vary accordingly, but are often a function of customer activity (e.g., spend-related interchange), float income on deposits, or subscription software fees.

**Figure 16. Banking-as-a-Service Supports Digitization and Unbundling, Modularization of Traditional Banking Services**

Banking-as-a-Services Model 'Stack'		Select U.S. Examples
<b>Customer-Facing Application Layer</b> (typically in digital context)	<i>Banking services embedded in non-bank entities such as challenger banks, technology providers, marketplaces, merchants/brands, gig economy platforms, traditional banks</i>	Apple - Apple Pay Cash Chime - bank account/debit card functionality MoneyLion - bank account/debit card functionality Uber - mobile bank account, instant wage disbursement, debit card rewards
<b>Banking-as-a-Service technology layer</b> <i>Technology layer provides accessibility (often via APIs)</i>		BBVA Open Platform Green Dot BaaS Platform Cross-River Bank O2 Open
<b>Banking Infrastructure Layer</b> (Regulated, Licensed Entity)	<i>Bank account/funds warehousing, money movement, debit card issuance, lending, etc.</i>	Bancorp Bank BBVA Cross River Bank Green Dot Bank StoneCastle Deposit Network of Community Banks Bespoke bank arrangements

Source: Citi Research

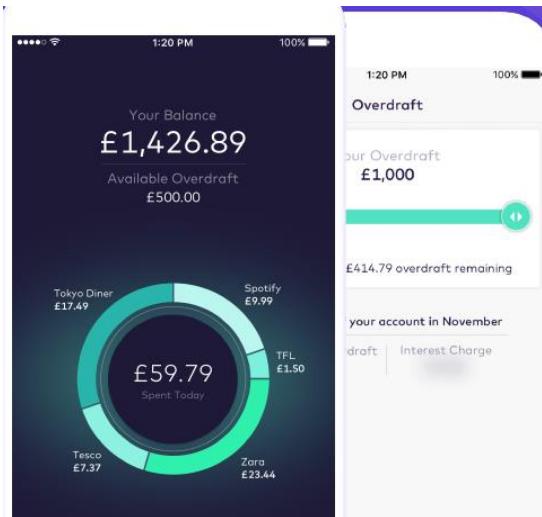
## Case Study: Starling Bank – A Bank with No Legacy

Starling Bank is a fully U.K.-licensed digital, mobile-only challenger bank founded in 2014 by Anne Boden (formerly COO of Allied Irish Bank). Starling offered its first mobile personal current account in May 2017 and services consumer and small businesses. It also provides 'Banking Services', including a scalable cloud-based Banking-as-a-Service proposition and real-time access to payment services for third-parties. It is one of the few challenger banks to have set up its own technology stack compared to most peers who often rely on third-party core-banking systems.

What differentiates Starling from other incumbent banks is its lower cost base and lack of physical branches. For traditional banks, CEO Anne Boden believes that legacy systems make it nearly impossible to lower the cost base meaningfully. While a core banking overhaul could possibly deliver cost saves, the high complexity and execution risks make undertaking such overhauls unlikely.

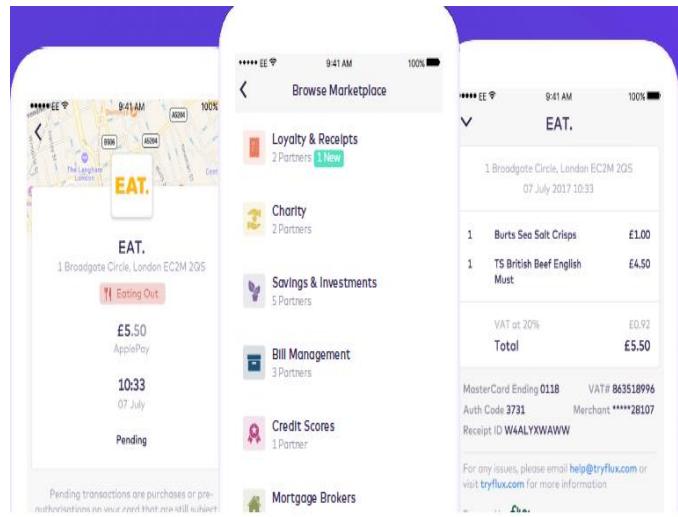
Starling allows customers to open a current account in 10 minutes with full controllability through their mobile app. Its modern technology framework is capable of quickly adapting to rapid changes in customer needs and using Starling's interface, customers can also do international money transfers, easy bill management (via third-party integrations with Flux) and manage investments (via Moneybox). The bank recently also introduced Euro accounts, which allow U.K. customers to hold, send, and receive euros for free.

Figure 17. Starling Bank: Current Account and Overdraft Service



Source: Company website

Figure 18. Starling Bank: Easy Bill Management – Powered by Flux

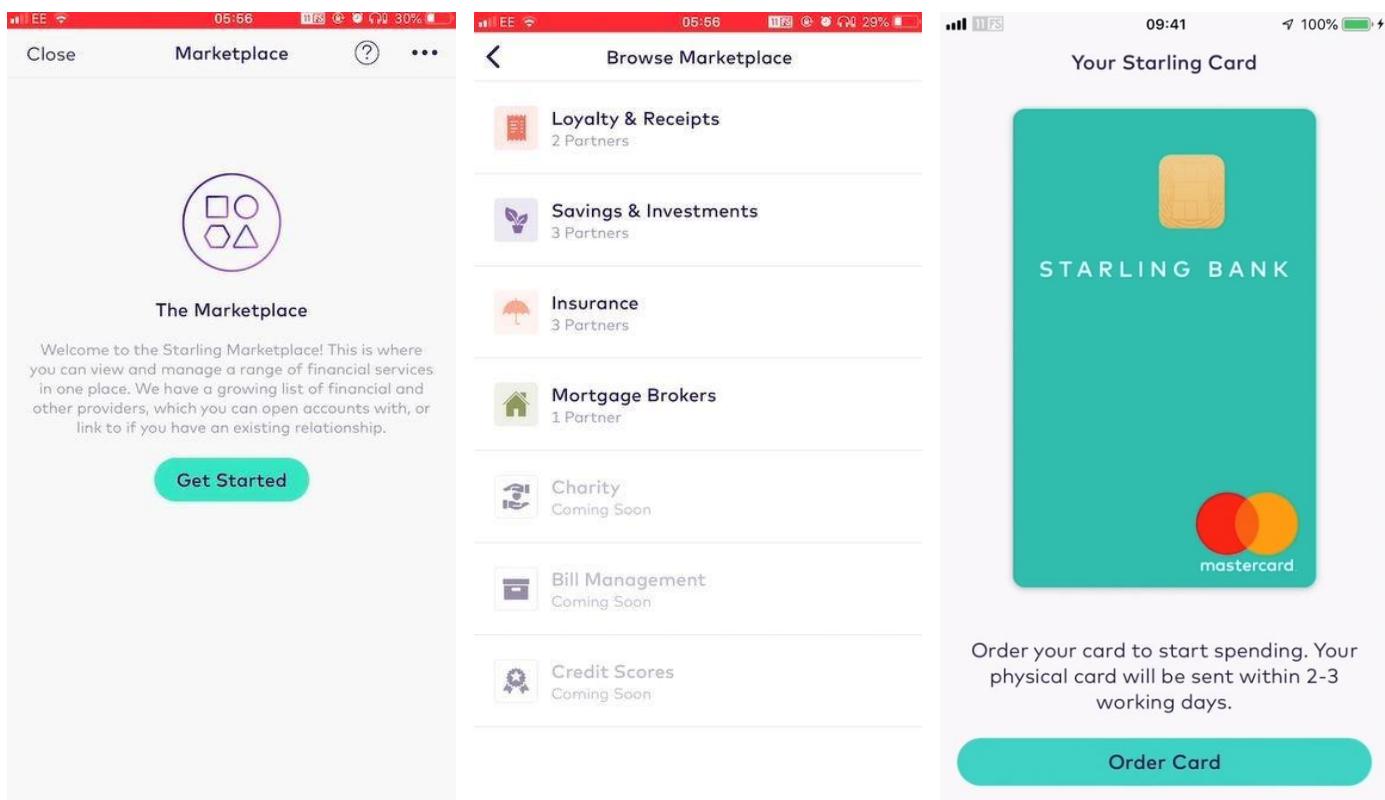


Source: Company website

Starling's Marketplace is an open API, offering consumers a wide range of competitive third-party financial products and services (e.g., savings & investment, insurance, pensions, mortgages, bill management, P2P investing etc.) through partners such as Pensionbee, Wealthify, Wealthsimple, Kasko, and Habito. The bank also offers personal and business customers a contactless debit Mastercard.

To facilitate small business accounts, Starling Marketplace has partnered with accounting software platform Xero, to automatically integrate their banking transactions into the cloud.

Figure 19. Starling Bank: Marketplace Functionality and Starting Bank Card



Source: Company app, 11 FS

Starling's Banking-as-a-Service technology enables businesses (such as banks/FinTechs) to launch their own customized products by providing core banking infrastructure, real-time payments, and support for product offerings through the marketplace. Starling offers a low cost and scalable core payment infrastructure with an open embedded API framework, allowing for faster addition of new providers/partners. Starling can also help develop regulatory aspects including scheme compliance, Anti-Money Laundering, and Know-Your-Customer.

# Banking-as-a-Service and Smart Money Management

## An Interview with Anne Boden of Starling Bank

**Anne Boden** is CEO and Founder of Starling Bank, which she started in 2014. Previously, Anne was COO of AIB (2012-13), Head of EMEA, Global Transaction Services, RBS (2009-11) and occupied senior roles at ABN, Aon, UBS, PwC, and Standard Chartered. Anne has almost 40 years of experience in banking and financial services.

### About Starling Bank

Starling Bank is a fully-U.K. licensed digital, mobile-only challenger bank founded in 2014. The bank offered its first mobile personal current account in May 2017 and services consumers and small businesses. Starling also provides 'Banking Services', including a scalable cloud-based Banking-as-a-Service proposition and real-time access to payment services for third-parties.

#### **Q: Why did you set up Starling Bank?**

I set up Starling Bank in 2014. A career at the top of some of the U.K.'s top banks had left me disillusioned. The financial crash and emerging technologies presented vast opportunity for change, but change was just not happening. So I decided to make that change happen myself. I did a lot of research and decided that what was needed was an app-based bank, built around customer needs. So that's what I decided to do, initially funding the bank myself.

#### **Q: Why does the U.K. have so many new challenger banks? Do you see similar developments in other countries?**

Recognizing the need for competition and innovation in the banking industry, the U.K. regulatory authorities introduced financial services reforms in 2013 to support new banks seeking a license. Since then dozens of new banks have been authorized. However, it is fair to say that very few have provided current/checking accounts and Starling is perhaps one of only a few. While the new framework supports the creation of new banks, most of these banks are not truly new but derived from other types of institution. A genuinely new entrepreneur-led bank, offering true innovative competition is a rarity. Supporting the growth of such banks must be made a priority and this can more easily be accomplished by competitive authorities rather than regulators.

#### **Q: What are the core products offered by Starling? How is it different to other challenger banks set up in the U.K.?**

Starling offers app-based banking with personal, joint, business, and euro current accounts. The app is loaded with smart money management tools with balances updated in real time. The Starling Marketplace gives the bank's personal and business current account customers access to third-party financial services providers. In addition to its business-to-consumer (B2C) business, Starling has a Business-to-Business (B2B) Banking Services business, providing payment services and Banking-as-a-Service.

We differ from many other challenger banks in many ways - we have no branches, we have a full banking license, and we have a suite of unrivaled smart money management tools.

**Q: Can you explain what Banking-as-a-Service is and how does Starling participate in this space?**

Starling is a pioneer of Banking-as-a-Service, a model that allows customers to access its banking platform, utilize its banking license, and access payments schemes using Software-as-a-Service-style delivery (largely subscription based).

Starling's modern API interface allows clients to easily access and mix-match product offerings, from credit cards to fully functioning bank accounts via an API.

There is an enormous range of potential clients across corporates, e-money institutions, other banks/financial institutions, retailers, and consumer brands. These clients generate income for Starling from monthly service and/or per account fees and from transaction fees.

Starling is the only bank to have designed and engineered a set of industry-leading APIs that allows it to offer real-time Faster Payments to other organizations. By giving its customers access to infrastructure traditionally held in the back end of banks through its APIs, Starling provides faster, more efficient, and highly competitive payment processing to institutional and corporate clients.

**Q: How many FTEs does Starling have?**

We have nearly 400 FTEs and rising.

**Q: What is the technology stack that Starling is built on? What is the dis/advantage of using established vendors?**

The platform is core Java mostly running on relational data (postgres) all deployed in the AWS cloud. All the code is proprietary to Starling and the advantage over a vendor platform is velocity for the product and innovation - and in time total cost base per customer.

## Building an SME Challenger Bank

### Interview with Rishi Khosla of OakNorth

**Rishi Khosla** is a British-Indian serial entrepreneur and co-founder of OakNorth Holdings, a global FinTech firm focused on enabling entrepreneurs worldwide to access customized mid-sized loans

#### About OakNorth

Historically, there's been a massive focus on tech efficiency within the retail and small SME space, and a massive focus on people within the corporate and large business space. As a result, the segment of the market that we focus on (customized mid-sized loans) has been overlooked and underserved for decades.

OakNorth Analytical Intelligence (ON AI) is how we're solving this problem globally – within the U.K., we do this via balance sheet lending (OakNorth Bank plc) lending between £0.5-£40 million to businesses and property developers, and throughout the rest of the world, we do it with by licensing the ON AI technology to other banks and lenders.

**Q: Could you explain to us why there has been an explosion of new challenger and digital banks in recent years?**

I believe the banking world in the U.K. took a turn after 2013 when the Financial Services Authority (FSA) put out a paper relaxing the capital requirements for the opening up of new banks. The policy paper changed the regulator's mindset towards new banks, helped increase healthy competition amongst banks, and brought about new and innovative propositions for customers.

**Q: What were some of the challenges you faced while setting up the new bank?**

In 2005, when we were setting up our first business, a financial research company called Copal, we had gone to a major U.K. bank to request a line of credit of a few hundred thousand pounds. The bank informed us that in order to get a line of credit, we needed to provide some kind of property collateral.

At this point, we realized that commercial banking often tends to be very standardized in their approach with set requirements to be met in order to do business. While this works well for large corporate business, it doesn't work well for new startups, which often don't have cash flows or collateral to offer.

We have taken these learnings into account while setting up the new bank. Further, we have supplemented it with data science to create a very effective platform to service the needs of SME's.

**Q: Both the co-founders of OakNorth come from non-commercial banking experience. Do you think the lack of banking experience presented any hindrance while regulators were considering your applications?**

Yes, regulators prefer if entrepreneurs setting up a new bank have some kind of commercial banking experience. However, I do not think this presented any major hindrance for us as we compensated this with other senior members of the team who have decades of banking experience.

However, it must be said that getting the right people with the adequate mix of commercial banking and entrepreneurial experience was a big challenge for the bank in the initial years and we went through a series of employee chucks.

**Q: Can you please detail the mix of your leadership team?**

We have consistently looked for people who were knowledgeable on lending, not necessarily from traditional banking. Our employee mix consists of individuals with experience in traditional banking, other credit lending funds, and from technology.

One of the other challenges we have faced is around melding these different cultures into a new digital bank. Our aim has been to create a digital-focused bank and not yet another big bank.

**Q: Can you elaborate about different parts of your business and how each part functions?**

Fundamentally, the business is about the platform that we built. We take the institutional level of credit analysis and apply it to small-to-medium-sized lending — which is the core of our business.

Our proprietary platform helps us run credit analysis and monitor the loans we make — enabling us to benchmark businesses at a micro level. Then we use that to analyze the fundamentals of the business under stress cases. Post completion of the transaction, it is about close monitoring of the loans.

We start by collecting data around a particular business that is looking to borrow money from us, i.e., financials etc. In most typical big banks, this is the start and end for borrowing money. In our case, this is just the beginning of the process.

We then supplement it using data pulled from external sources — which includes comparative data from peers and also specific industry groups. This helps us spot trends in the business which may not be visible purely from looking at the company's financials and their own projections about the business.

**Q: Do you have balance sheet business elsewhere apart from U.K.?**

We launched the balance sheet business in the U.K. in September 2015 but felt the most effective way to scale our proposition would be through licensing our technology to other banks around the world. Outside the U.K. we work with partners using a Banking-as-a-Service model.

In terms of loans, we have lent £3.0 billion and have had about £500 million of repayments. In the U.S., we started six months back and have built the platform. But we do not have a balance sheet business. Instead we partner with other financial institutions who may decide to give the loan. We have seven other markets, where we have platforms and partners, e.g., NIBC is one of our disclosed partners. Most of our partners are banks, but there is also one investment fund.

**Q: What has remained as your borrower focus group across markets?**

In the U.K., our borrower focus is on SMEs with up to £100 million in revenues, looking to borrow up to £40 million. Our loans start from half a million pounds up to 40 million pounds.

**Q: You haven't had any non-performing assets (NPAs), non-performing loans (NPLs), or defaults on your U.K. loan book – how do you reassure investors who may say that you have not been through a cycle of 7-10 years?**

Yes, the longest delay we had was 40 days from past due but that was paid off on the 40th day. Apart from that, we have not had any bad debts or defaults. To answer your second part, I see most commercial lenders put out loans and then close their eyes and wait it out to season.

Banks often only look at the credit experience at the end of the period (i.e., let's check if we have got our money back, or not). Instead, our approach is a more proactive monitoring of the business – the operational and financial data. This helps give us a clear idea of how the business is trending so we can see where the potential issues may be in the book. This helps give us better visibility into business.

We have more insights into how the underlying business is performing. Yes, we haven't been through a cycle, but we have put out £3 billion in a period of about 3.5 years with no bad debts and we believe there are very few businesses have done that.

**Q: Can you elaborate on what your distribution and marketing model is like?**

The brand we have created is for effective lending for entrepreneurs by entrepreneurs. The brand we created for the deposit market was well received by depositors as well. They feel they are doing something good for their country.

We have adopted for a pure online and digital strategy. We raise all deposits through that channel which helps to bring down our operating costs. It's very appealing to people who are looking for attractive rates online and also the story around the businesses they're supporting who are the backbone of the economy and their local communities.

We do very targeted marketing and this leads to a strong referral base — 70% of our flow in business lending is via referrals.

## Dozens: Putting the Fin into FinTech

### Interview with Aritra Chakravarty of Dozens

**Aritra Chakravarty** is the founder & CEO of Project Imagine and Dozens. Prior to founding Project Imagine/Dozens, Aritra spent over twelve years at HSBC, across London, New York, and Hong Kong, in M&A, trading, strategy, private banking, and digital wealth management.

#### About Project Imagine

Project Imagine is working on creating a second-generation challenger banking and wealth management alternative from scratch. It is currently authorized by the FCA to provide eMoney services (providing current accounts, debit cards and payment facilities to its customers), and also for MiFID Investment Management services (distributing, managing and arranging investments for its clients), but is not a bank. The aim is to combine original finance and tech solutions to actually help people save and grow their money, rather than just enhance usability. Project Imagine's first consumer brand Dozens is live on U.K. app stores. Dozens is creating a new home for your money, with a mission to make saving easier and more rewarding for all. It brings together a current account, a smart budgeting tool, and a savings and investment manager — all in one app.

#### Q: Can you please elaborate the challenger bank landscape in the U.K.?

The U.K. is ahead of the curve globally when it comes to challenger banks (Metro was the first high street bank to get its license in over a 100 years, followed by Atom, Monzo, Starling, and others) as well as FinTechs offering banking services such as a current account and foreign exchange (FX) payments (Revolut, Tide, etc.).

When the FinTechs initially started, incumbent banks didn't really take notice of the huge insurgence about to happen. It's only subsequently when the user bases for these brands grew substantially, that incumbent banks took reactive action, but still only on pricing, and not on user experience (UX) or proposition.

#### Q: When you were setting up a new digital bank in London, what were some of the thought process you were going through? What was the trigger for wanting to setup a new bank?

The decision to setup a new FinTech wasn't triggered by a single big moment, but instead was made up of a series of thoughts over a long period. When I was doing my thesis on banking returns and how banks measure returns I realized how difficult it was to accurately measure the risk-adjusted performance of financial institutions, thereby making it harder to reward the right behaviors internally. My time in various divisions of a large global bank across NY, London, and Hong Kong, also made me realize how organizational structures and incentives end up creating product silos.

We wanted a business model based on people saving and not from people borrowing. This series of thoughts resulted in setting up Project Imagine as an incubator for financial brands and ideas that envision a world with greater financial equitability, and Dozens as its first poster child.

**Q: What inspired you to build Dozens?**

The problem with banks today is that with the amount of data and the amount of deposits they sit on, they have absolutely no incentive to help people save. Their business model is completely reliant on credit; on lending people money. The only reason they want depositors is so that they can lend out to more people and make more money. So we needed to rethink the business model from scratch to make sure that we're aligned with people wanting to save, for us to help them, but as a profitable business rather than a charity. And the only way to do all of that was to create a new company.

**Q: What do you think are the key challenges in setting up a challenger bank?**

By far and by many, technology is considered to be the biggest barrier to entry in the challenger banks sector. However, I think this isn't completely true. Instead the bigger barrier is getting the right talent to work at a startup and obtaining regulatory licenses etc. The technology part is in-fact simpler in today's day and age.

**Q: How did your previous career provide the foundation for Dozens?**

Actually the role I'm doing right now is probably one of a handful of roles that have benefitted from all the different things I have done previously; I've had quite the haphazard career. I started off in mergers and acquisitions, where you learn how to spend very long days at the office, but also how to read financial statements, make decisions on valuations and what defines a good deal versus a bad deal. I then moved to capital markets, where you learn what things make markets move and what things are good for companies. In the equity capital market space specifically, which is where I was, you deal with a lot of entrepreneurs doing IPOs and you see what kind of IPOs sell and what kind of companies you need to build in order to get to that stage.

I also traded stocks and issued convertibles, and then I worked in principal M&A, so buying and selling banks. In that role you need to understand how big bank management teams make decisions, what matters to them when acquiring smaller banks, or what they consider when selling parts of their business. I then moved to a strategy role where we had to do a massive clean-up which gave me a really good first-hand experience of what not to do when it comes to things like Know-Your-Customer' (KYC) and Anti-Money-Laundering, and really understanding how important regulations are. Finally I moved into a digital role, creating digital products from scratch for services that were only sold offline before, and built a team from nothing to 300 people.

**Q: What is different at Project Imagine compared to other challengers or digital+only banks in terms of offering or service?**

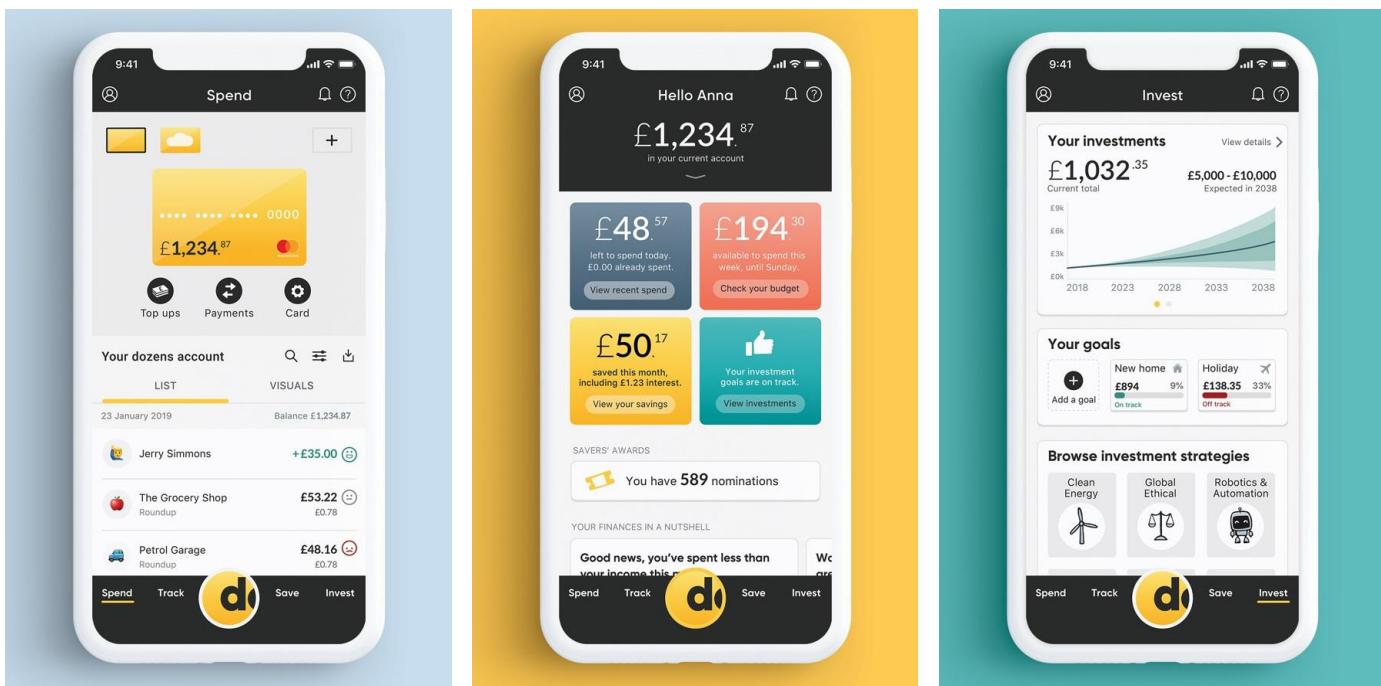
Remember we are not a bank yet. So the fact that with our eMoney license we are able to provide current accounts, debit cards, payment services etc. to U.K. retail customers, is in itself indicative of the competitive landscape. But with our Investment license, we are also able to offer ETFs and other proprietary investment products on our platform, so that relatively unique license structure is our first key differentiation.

Second, from a user point of view, the FinTech revolution has produced a vast array of digital banks, investment trackers, and saving and budgeting apps. But the side effect is that people's finances are more fractured than ever, making their money management more complicated.

Our first solution, Dozens, brings all of these elements together in one app, giving people better and easier control of their finances by taking them on a Spender to Saver to Investor journey.

So, I think while other challengers have done a great job in passing on some cost benefits, i.e., not charging you for services you're used to paying for like FX, we want to use financial innovation to try and close the 'advice gap' and to pass on revenue benefits i.e., making savings and investments easier and more rewarding for everyone.

Figure 20. The Dozen's App Interface



Source: Company website

**Q: Do you think the proposition of challenger banks is generally about a better price and ease of use? Is something else also needed?**

Yes, I do agree that while better pricing and ease of use are good value propositions challengers offer to customers, there is still the need for that something else to differentiate any banking proposition in the longer run.

In the case of Project Imagine, I think that something else is that we are the 'Fin' in the FinTech. Most other challengers tend to have started off as a technology firm; whereas we also have strong financial roots.

**Q: Can you share the tech stack you are using? It is completely built in-house or off-the-shelf?**

The Dozens app is built on our own balance and orchestration layer, utilizing our own licenses. Controlling the balance allows us to offer more innovative financial products, as well as serve as the foundation for a core banking system in the future. Build Specs include:

- Native mobile applications for iOS 11+ (Obj C/Swift) and Android 5.4+ (Java + Kotlin);
- Modern micro services architecture, using more than 10 managed services to reduce development and operation efforts;
- Fully hosted in AWS (London region), with high redundancy planning using hot/cold plugs and 3x AWS physical zones;
- Kubernetes is used to manage horizontal scaling of servers;
- More than 20 partner tech integrations, with service level agreement (SLA)-based monitoring and alerts system using enterprise-ready DataDog software; and
- Custom Admin Panel to provide cross-partner/cross-platform operations scaling and monitoring.

**Q: What are some of the pros and cons you see between innovations in a big bank vs. a challenger bank?**

Technology is often considered to be the biggest challenge incumbent banks face when competing with challengers. I often use the analogy of a PowerPoint deck getting its information from an Excel pivot table, which runs on raw data stored in CSV files. Think of the PowerPoint as the front end, the pivot table as the orchestration layer and the CSV files as the back end. A lot of banking innovation has been changing the PowerPoint deck rather than changing the way the data is stored or processed and it's proven really hard to do the latter – no different to making changes to a presentation.

This is because an incumbent bank has to overwrite its legacy software with newer ones and this is a large and cumbersome process involving huge costs and time. However, although technology can be expensive and may take time compared to the other challenges, it is perhaps relatively easier to tackle.

I think the biggest challenge for incumbent banks is around people, organizational structure and incentive structures. For instance, if the digital and technology functions in a bank sits outside of the finance function and integrate only at the senior management level, there is only so much digital-led innovation that can take place in the firm as it has to be top-down driven. Instead if technology is embedded in the finance function, it's more likely to offer innovative solutions.

There are also product silos; people in a bank look only after their own product, rather than a customer segment. The people responsible for segments are usually more propositional, so they may talk about the bank's brand and the offering, but they don't actually make product decisions, which means that tailoring products to customer needs is incredibly difficult.

The final challenge incumbents' face is around incentive structures. Most digital/technology transformations take four to six years to implement. For a big bank, this is quite a big bet with extensive risks. By contrast, incentive structures in most banks tend to be driven by yearly performance. Hence there is little incentive for individuals to undertake risky transformations in incumbent banks.

Challenger brands on the other hand have to earn trust. They have to learn how to face regulators, govern product decisions transparently, keep the lights on 24x7 – things that most conventional banks actually do very well.

**Q: Can incumbent-sponsored challenger banks replicate innovation pulled by a standalone challenger bank?**

When an incumbent bank supplies its parent brand to its digital arm or virtual bank or for branding and marketing it automatically generates interest from the parent company management to look over the shoulder of its challenger arm and access returns, risk propositions etc. This takes us back to the initial problem of organizational and incentive structures.

However, if an incumbent bank can genuinely work at arm's length, it is possible to replicate the challenger bank model and be equally revolutionary in those areas – with the added benefit of trust from the parent brand as leverage.

It's a race to the finish right now — will incumbents learn to decentralize decision making and leverage trust without jeopardizing decades of brand value, or will the challengers learn how to consistently deliver, stay funded, and win trust while dealing with regulations and governance. We will find out but one way or the other – but ultimately the customer will likely win!

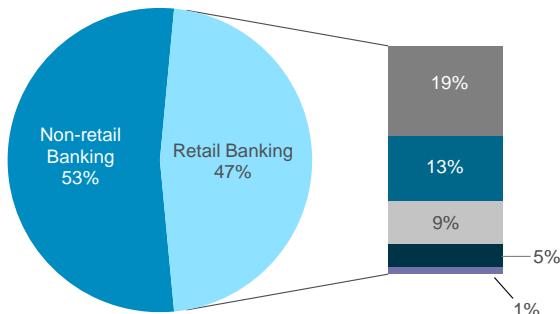
## Virtual Banks in Hong Kong

Hong Kong has lagged global leaders in banking digitization. This is set to change with the Hong Kong Monetary Authority (HKMA) looking to issue the first batch of virtual banking licenses in the first quarter of 2019. The arrival of virtual banks will reshape the landscape of Hong Kong retail banking and add new competition.

We estimate a HK\$200 billion (\$25bn) revenue pool per year for Hong Kong retail banks, and more than half of that is from wealth and deposits. Higher contribution from capital-light products compared to global peers makes Hong Kong banks more susceptible to disruption from digital new comers.

**Figure 21. Hong Kong Banking Revenue Breakdown by Product and Customer Segment**

■ Deposits ■ Wealth ■ Personal Lending ■ Payment ■ Other



Breakdown based on company reports of key HK banks  
Source: Citi Research

**Figure 22. Global Banking Profit Breakdown by Product and Customer Segment**

■ Savings & Investment ■ Personal Lending ■ Payment ■ Other



Breakdown based on the banks under Citi coverage; the profit split by customer segment is based on company reports or analyst estimates; the profit split by product is estimated based on select banks that have relevant disclosure.  
Source: Citi Research

Front-runners in this license race are mostly incumbent banks and large tech companies with experience operating a financial business, e.g., Standard Chartered, a JV formed by China CITIC Bank and ZhongAn, Tencent's WeChat Pay HK and Alibaba's Alipay HK. The HKMA allows no regulatory arbitrage between traditional banking and virtual banking. Besides a minimum capital requirement of HK\$300 million (\$38m), applicants have to prove to the HKMA that they have a viable business model and sound risk control.

Aside from technology, applicants must have a robust risk management framework, adequate liquidity management capability, and sophisticated compliance procedures that can match those at traditional banks. These hurdles would naturally favor more mature applicants with more abundant resources.

Figure 23. Some Hong Kong Virtual Banking License Applicants



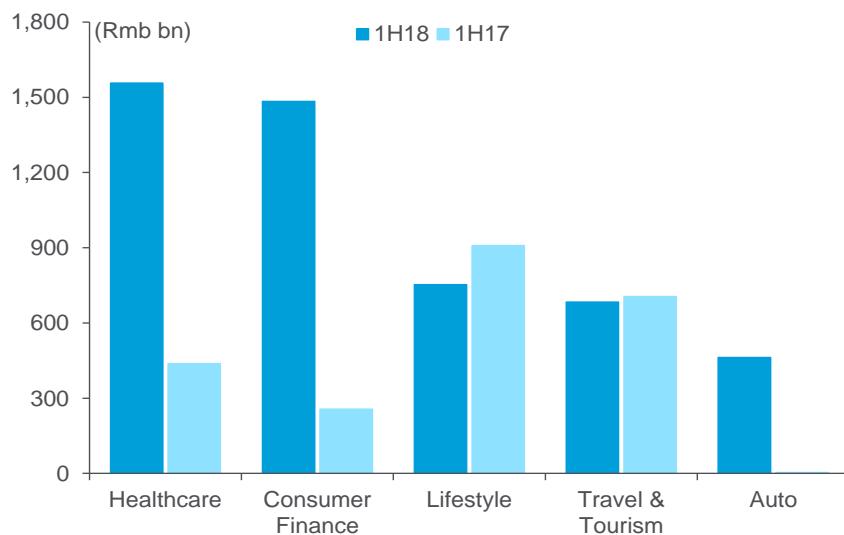
Source: Citi Research, Company websites

### Case Study: CITIC Bank + ZhongAn – Banking and Insurance Go Hand in Hand

CITIC Bank is currently applying for a Hong Kong virtual banking license together with ZhongAn. CITIC Bank, which is based in mainland China, already has experience in financial service partnerships through its venture with Internet giant Baidu in forming aiBank, one of the leading digital banks in mainland China.

ZhongAn is the first Chinese digital-only insurance company co-founded by Ant Financial, Tencent, and Ping An. ZhongAn primarily focuses on property & casualty (P&C) insurance in China, providing protection products not currently offered by conventional insurance companies — smartphone screen protection insurance, credit card fraud insurance, etc. ZhongAn distributes its products through a wide range of Internet platforms including Taobao, Ctrip, Tmall, Meituan, and Zhaopin. The company has over 300 million customers.

Figure 24. ZhongAn's Total Premium by Segment



Source: Company reports, Citi Research

CITIC Bank International is the legal entity for CITIC's Hong Kong operation. CITIC Group expanded into Hong Kong by rescuing a local savings bank called Ka Wah Bank in 1986. Kah Wah Bank was renamed as CITIC Ka Wah Bank in 1998 and later acquired Hongkong Chinese Bank. In 2010, CITIC Ka Wah Bank was renamed as CITIC Bank International.

Like many other Chinese banks expanding into Hong Kong, CITIC Bank faced challenges acquiring retail customers to reach material economies of scale. Limited retail presence increases the funding costs of smaller banks operating in Hong Kong. The high cost of operating physical branches in Hong Kong also makes it economically unviable to grow through branch openings.

Because of these limitations we believe virtual banks offer a unique opportunity for some existing mid-sized Hong Kong banks to acquire digitally savvy new customers. By contrast, an incumbent such as HSBC will be less interested in launching a separate virtual banking license given its already high retail deposit market share of around 30%.

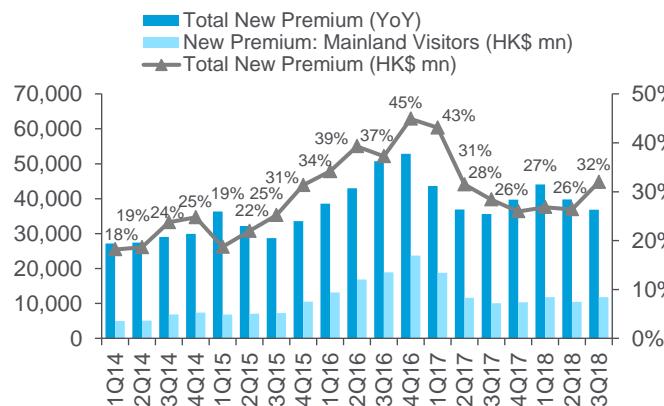
**Figure 25. China CITIC Bank Expanding Client Reach and Product Offering Through Partnership**



Source: Company website, Citi Research

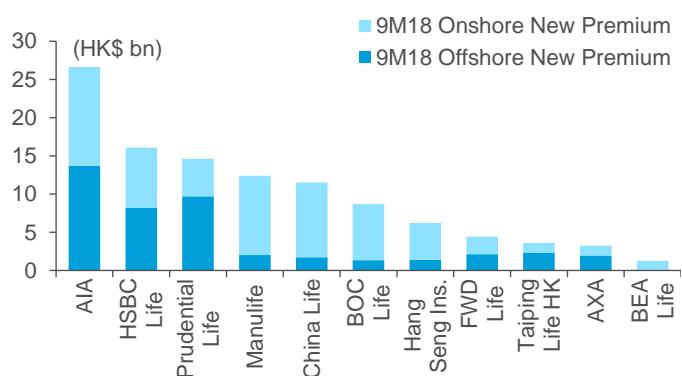
We expect a JV between CITIC Bank and ZhongAn to offer the full suite of retail banking products, leveraging on CITIC Banks' product expertise, and the JV could revolutionalize the P&C insurance market in Hong Kong to become a prominent player in insurance. ZhongAn's strength in digital distribution could open up its 300m+ customers to become potential customers for the virtual bank JV. CITIC Bank could also leverage ZhongAn's extensive partnership network as these platforms expand into Hong Kong or Hong Kong consumers seek cross-border service from them. To ZhongAn, cooperating with CITIC Bank would allow it to expand in two dimensions, product wise into banking and geographically into Hong Kong.

Currently ZhongAn is focused on P&C insurance, but news reports indicate it has ambitions to offer life insurance product in the future. Life insurance is a growing market in Hong Kong, benefiting from strong demand for life insurance products from mainland China clients. The Hong Kong new premium grew at 10%+ CAGR over the past years. And the larger Hong Kong banks have significant presence in the insurance market, with HSBC being the second largest life insurer in the city, in terms of new premium. ZhongAn is currently more P&C-focused, yet the addition of a digital bancassurance channel may allow them to experiment life product distribution in Hong Kong.

**Figure 26. Mainland Buying a Key Driver for 10%+ CAGR for HK FYP**

Note: FYP = first year premium

Source: Insurance Authority, Citi Research

**Figure 27. AIA, HSBC Life, and Prudential Are the Market Leaders**

Source: Insurance Authority, Citi Research

Outside of Hong Kong, ZhongAn and Grab have formed a joint venture to create a digital insurance marketplace in Southeast Asia. Grab is the largest ride hiring platform in Southeast Asia with over 130 million downloads. The JV will distribute P&C insurance products through Grab's mobile app to its vast user base digitally. ZhongAn insurance will offer the technical expertise of building an insurance distribution platform as well as insurance product expertise.

The unique selling point of the JV is that it addresses the usual pain points of insurance discovery — unaffordable premiums and payment options — by allowing for insurance premium payments to be adjusted and automatically deducted through GrabPay or its affiliated payment partners. Their initial offered product offering is likely to be a driver's insurance to protect drivers from loss of income owing to illness or accident, to be launched in Singapore in the first half of 2019.

Ultimately, the JV is consistent with Grab's strategy to diversify its product offering beyond ride hiring. In recent years, Grab has ventured into food delivery, payments and more. This will be another step for Grab to venture further into financial services through the distribution of insurance products. Additionally, Grab also has plans to venture into remittances.

We believe the tie-up between Internet players and financial service providers is a growing trend, aimed at leveraging each other's strength to transform customers' banking experience. Looking ahead, banking is likely to become more seamlessly integrated as part of our life through social and multi-functional super apps.

## Building Challenger Banks in Asia

### Interview with James Lloyd of EY

**James Lloyd** is Asia-Pacific FinTech and Payments Leader at EY. James and his team are currently supporting the design and development of several “greenfield” challenger banks in Asia.

#### About EY Fintech and Payments

EY's dedicated FinTech and Payments teams work with a wide range of clients, including early- and growth-stage FinTechs, incumbent financial service players, platform challengers, payment service providers, distribution partners, investors, and entrepreneurs.

#### **Q: When did supporting new digital challenger banks become one of your key areas of focus?**

While we have been supporting emergent players for quite some time, it's in the past year that I've dedicated a large majority of my time to this area; there is a huge amount going on across the APAC region. Challenger banks have clearly been a trend globally over the past few years, especially in markets like the U.K. Activity is now ramping up across Asia — from Korea to Australia, and Greater China to Southeast Asia. In Hong Kong, specifically, regulatory and infrastructure change is currently driving a tremendous level and sophistication of challenger-related activity.

By way of context, in May 2018, the Hong Kong Monetary Authority (HKMA) published a revised Guideline on Authorization of Virtual Banks. In effect, this allows for the retail bank licensing of new players — with a particular focus on non-traditional players. Hong Kong is not the first market in Asia to seek to issue new licenses in this way, but it does have particular significance given the city's status as an international finance center, the availability of capital here, and potential access to the wider Greater China market.

#### **Q: What do we mean by “challenger” or “virtual” banks, and how are they different to legacy banks?**

The term virtual bank really just means a digital-only proposition — that is, a bank with no branch network. Foregoing traditional physical infrastructure obviously has an impact on costs but, importantly, it can also have a big impact on customer experience. Virtual or digital banks typically involve online customer onboarding, servicing, and engagement. Of course, the specific results, products, and services can take many different forms, particularly as a range of different players — from incumbents to platforms — seek to build their own digital-only or “challenger” bank.

DBS Bank, for example, has already launched a mobile-only proposition in the growth markets of India and Indonesia. Similarly, CIMB and other regional banks have announced that they are in the process of launching digital-only or mobile-only propositions in markets such as the Philippines and Vietnam. In Hong Kong, Standard Chartered has announced that they are in the process of seeking authorization for a digital-only ‘virtual bank’ proposition.

In addition to existing banks launching new challenger propositions, a range of other players are also getting involved — from growth-stage startups to scale platforms with established customer bases. In the U.K., we have seen a range of new startups raise funding, build new propositions, and begin to organically acquire customers. In Asia, platform players are also beginning to emerge.

Kakao Bank in Korea, for example, is built on top of the country's largest mobile messaging service. Similarly, in China, the large Internet players have sought to capitalize on their extensive ecosystems by launching a range of first- and third-party financial services.

**Q: What has led to the situation where so many traditional banks are saying, we want to have our own challenger bank?**

If you are sitting in Asia as an incumbent bank, you are seeing first-hand the impact that technology-led platform players can have on your customer interactions as they expand beyond their anchor use-cases and move laterally into financial services. Consequently, a lot of bank CEOs and management teams in the region are re-examining their current propositions and seeking to double-down on all aspects of digital customer engagement.

One question to consider is whether to continue to invest in existing infrastructure or seek to replace it, either in part or en masse, with a new digital technology stack. This is where the opportunity for "greenfield" solutions could be especially powerful — building something off to the side, using components that perhaps could ultimately be brought back into the core proposition. There are huge opportunities associated with building solutions unencumbered by legacy technology, processes, and mindsets. That's not to say that all legacy is necessarily bad; think of the advantages of proven risk management functions, for example. But a combination of both innovative and trusted solutions can be quite powerful.

Another factor here, which we believe will be especially visible in Asia, is that building something new provides an opportunity to drive deep strategic partnerships with a variety of other players at an equity shareholding level. This could be between banks and non-banks, technology players and distribution partners, or some unique combination thereof. In fact, I would go so far as to say that a defining feature of challenger banks in Asia will be the emergence of multi-party joint ventures seeking to create true partner "ecosystems" which extend beyond financial services into other areas such as travel, transportation, retail, and telecommunications.

**Q: When it comes to choosing a tech stack, how are these new greenfield banks going about it?**

Technology stacks don't tend to be uniform constructs. Indeed, we are currently seeing a range of technology solutions and system architectures come together based on a variety of client-specific and market-specific considerations. In general, there is a balance between going all-out with the newest tech innovations versus selecting long-term proven solutions. In reality, most challengers are choosing some combination of both.

Take core banking systems, for example. Many traditional service providers are pushing digital credentials in relation to their legacy propositions and, certainly, some progress has been made in this regard. On the other hand, you have newer, typically more modular, offerings leveraging latest technology/data architectures. Again, there's no one-size-fits-all solution. It's very much dependent on elements like product roadmap, target markets, and even strategic partner capabilities.

I think, ultimately, it's going to land somewhere in the middle. Players need to make sure that the core is sufficiently robust and scalable and, from there, build as much as possible at the API layer. The key considerations here are flexibility and control – as well as the ability to efficiently integrate with a range of third-parties.

**Q: Can you elaborate on what have been the biggest challenges in the last 10 or 12 months while setting up these challenger banks, and how different or similar is it to set up a challenger bank in Hong Kong vs the U.K. or Southeast Asia?**

Needless to say a major consideration from the outset is whether or not new players can even get licensed. In Hong Kong, at least, the regulator has focused on applicants which can demonstrate sufficient financial, technology, and risk management resources to operate a digital-only bank. It's also been necessary to construct a credible and viable business plan, supporting such areas as improved customer experience and financial inclusion.

All said, what I think is going to be different about Hong Kong relative to markets such as the U.K. is that the strongest new entrants will likely emerge with an established customer base. We are going to see platforms move laterally into financial services, as well as traditionally offline networks beginning to leverage their own networks for bank product distribution. These are players that are learning lessons not just from growth-stage U.K. challengers, but also from scale technology "ecosystems" of mainland China and emergent super apps of SE Asia. Also, and in our view almost by definition, many of these new banks are likely to emerge as multi-party joint ventures as we've already started to see in Korea and elsewhere in Asia.

**Q: In terms of banking or payments, where do you think Hong Kong is compared to mainland China or Singapore or the U.K. in terms of digital readiness?**

By comparison to mainland China, most global markets now look somewhat behind. In terms of context, much like Singapore and the U.K., Hong Kong is generally well-served by traditional electronic payment instruments. Credit card penetration is very high, and almost everyone has an Octopus card — which effectively serves as a substitute debit card — with penetration and acceptance across not just transport but also sectors such as retail, and food and beverage.

Nevertheless, while Hong Kong is already a heavily banked market, there is clearly an increasing appetite for next-generation digital services. The lag exists partially as a consequence of the city's geography. You're never more than a stone's throw from a bank branch, so people have become accustomed to that access and availability. Some people argue that it's equally true of e-commerce, since Hong Kongers are never far from a supermarket or convenience store.

In both cases, however, we believe that expectations will change – not least as a result of technology-led players offering truly differentiated experiences. People, especially but not exclusively younger people, are increasingly more sophisticated when it comes to leveraging new technology. They are 'mobile native' and willing to try new digital offerings when the benefits are clearly apparent. There is an opportunity here for Hong Kong to combine the best from mainland China and international markets to create genuinely innovative, customer-focused offerings.

**Q: Does the Hong Kong virtual banking license provide the ability to operate across the Greater Bay Area or is it just for Hong Kong?**

The virtual bank authorization provides for a Hong Kong retail bank license. The Greater Bay Area (GBA) plan, which is really a development agenda for Hong Kong, Macau, and a range of cities in southern China, is still in process — and the opportunities for cross-border financial service integration is still to be determined. However, there is certainly a lot of interest in the GBA opportunity, with considerable investments being made given the potential upside. We can expect to see a number of announcements in this space over the coming months and years. This is an especially exciting prospect for those players seeking to build Hong Kong challenger banks with an eye to other regional and even global ambitions.

# Building an SME-focused Neobank in HK and Why the HK Virtual Bank License is for BigTech

## Interview with David Rosa of Neat

**David Rosa** is co-founder and CEO at Neat helping Asia's underbanked open a current account in 10 minutes. David's career started at Citi, where he became their youngest managing director in Asia. He then co-founded the Asian arm of Integral Capital Management, which he sold in 2014 to focus on FinTech.

### About Neat

Neat is a Hong Kong-based FinTech startup that provides emerging SMEs with current account services and related financial solutions. It aims to reduce the paperwork, bureaucracy, and long wait times for SME banking clients.

#### **Q: What was the initial thought-process behind setting up Neat? What was the pain point Neat was looking to solve?**

Hong Kong is a very open trading and financial market with easy access to banks and relative ease in opening new bank accounts for established clients. However, when it comes to entrepreneurs/SME's, traditional banking processes can often prove to be very cumbersome.

For example, opening a bank account for SME clients in Hong Kong can prove very tedious with a lot of paperwork and long wait times, especially for individual proprietors who conduct business through Hong Kong by trading with China but are not necessarily Hong Kong residents. Further, startups often don't make any money in the initial years nor have regular cash-flows, which make them unattractive on traditional bank metrics.

Neat identified tremendous scope in the untapped SME sector and believed that with the right use of technology to streamline processes, it could offer a successful digital product aimed at solving SME customer challenges.

#### **Q: If traditional banks are unable to serve SME clients, why is Neat better positioned to service them?**

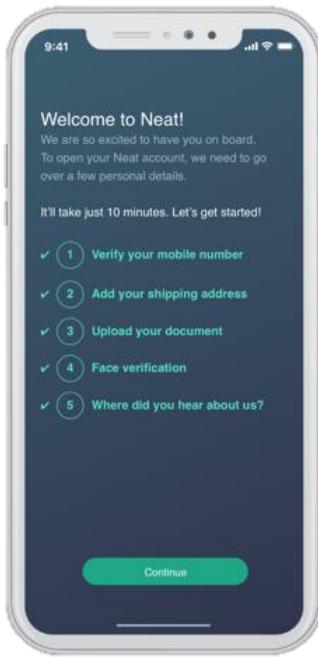
We believe one of the reasons for traditional banks inability to serve SME customers well, is their inherent need to offer the complete package of banking products to these customers. At Neat, we do not offer a full suite of banking products, which an otherwise traditional financial institution would offer.

In fact we offer a very simple business current account, which is a no-frills account, without any interest, insurance, or trade financing. The account merely allows the customer to pay and receive money across borders with ease. We believe this is what customers truly want, without the need for complex banking solutions and onboarding.

To further add value to customers and simplify processes, Neat has also seamlessly integrated with other partners offering non-banking solutions (e.g., Xero's SME accounting platform).

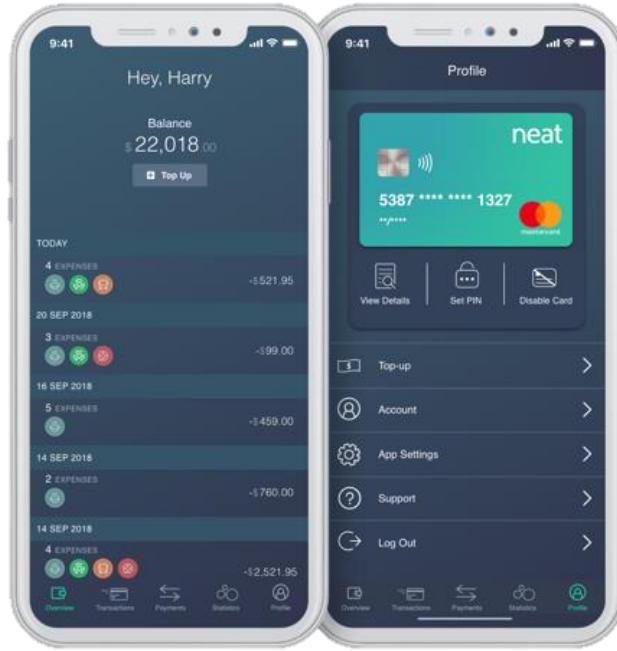
In addition, Neat has substantially lower new customer acquisition costs, lower operational costs due to absence of any physical branches, and a very robust digital process to help onboard customers. This helps it offer better cost efficiency vs. traditional banks.

Figure 28. Neat Offers Online Account Opening



Source: Company website

Figure 29. Flexibility to Spend Online or Offline via Prepaid MasterCard



Source: Company website

**Q: It is indeed quite difficult for young SMEs to open a corporate account with a traditional bank in Hong Kong as they are often seen as relatively high-risk. How do you manage and evaluate the risk there?**

We have a digital Know-Your-Customer (KYC) process in place. In fact, we are the first company to have a fully compliant e-KYC process in Hong Kong which won us an award from the Hong Kong Government. Digital KYC for retail customers has been adopted for quite some time but digital KYC for corporates is a substantial innovation.

We had developed an e-KYC system for retail customers. We then augmented it with an automated identification process which reverse-engineers who the ultimate beneficial owners and directors of a company are. Digital KYC is actually a highly relevant and sophisticated topic when it comes to virtual banking.

We complemented this with our customer risk profiling solution and related transaction monitoring rules.

Because of the young nature of our business customers, their turnover is low and we can therefore impose account limits which is another major risk mitigant. This is in contrast to a traditional bank opening a full-fledged bank account with no explicit limits.

When looking at virtual banks in Hong Kong with full-fledged bank accounts to be opened via an e-KYC process, a natural question to ask is whether a non-resident client can remotely open a bank account in Hong Kong. If no, the room for development for a virtual bank would be extremely limited given Hong Kong's small domestic market, making a virtual banking license less attractive.

If yes, Hong Kong can truly live up to its status as a regional financial center and potentially have a larger role in China's One-Belt-One-Road plan, but there are also many question marks regarding the risks involved and this will take time. I tend to believe that the ability for Hong Kong's Virtual Banks to accept offshore customer onboarding will be very limited, at least at the initial stages, considering the compliance hurdles.

**Q: What is Neat's unique selling proposition (USP) and how easy do you think it is for any new FinTech startup to copy Neat's business model?**

Neat will eventually have competition, we're after all going after a large target market with room for several players. When Neat initially started up, it was the only player in the market offering fully digital KYC. However, with the upcoming virtual bank licenses, banks will also be in a position to offer digital KYC. Nevertheless, I expect companies that receive the virtual bank license not to be direct competitors and be focused on retail customers rather than SMEs. Moreover, players receiving the Virtual Banking license are likely to focus on offering lending products, since they have a full banking license.

**Q: What kind of partnership do you have with traditional banks?**

Neat is an official partner of a Stored Value Facility in Hong Kong (similar to the e-money licenses in U.K.). This license is similar to a wallet license with more limitations but relatively less stringent regulations compared to a full banking license and allows Neat to provide basic financial products to its customers. The majority of our customers are in the e-commerce space, requiring predominantly only debit cards and international money transfer functionality. Neat also partners with traditional banks to provide virtual bank account number functionality for Neat's customers.

**Q: Why did Neat decide NOT to apply for the virtual banking license in the end? Also how do you think the new virtual banks will reshape financial services and banking in Hong Kong?**

The initial guidelines of virtual banks in Hong Kong were first issued as early as 2000, but didn't really take off. HKMA's original intent of developing virtual banking was financial inclusion on top of the ambition of bring Hong Kong into a 'New Era of Smart Banking'. Hong Kong retail banking is well penetrated with most of the citizens and established corporates having at least one account with a traditional bank, and most of the traditional banks already offer Internet banking.

Hong Kong is already a mature banking market. As a young company, we do not see any advantages for us to compete with traditional banks for the existing client base. Hence, we position ourselves for new customers, mainly young SMEs. Our vision actually aligns well with HKMA's initial idea of financial inclusion, but the economics of a Virtual Banking license don't align with it. Instead, we prefer to focus on more junior licensing which enable us to serve a customer base that really excites us as it can have a real impact in fostering sustainable economic growth.

Virtual banking will nevertheless introduce new competition from large Internet companies for Hong Kong. For the Internet companies, we have seen a lot of successful FinTech stories in China — Ant Financial and Tencent just to name a few. But interestingly, those companies succeeded in China usually by lending to a new client base that was previously untouched by traditional banks, or by monetizing from e-commerce rather than banking per se.

The Hong Kong banking market is a completely different market set-up and I am not sure whether those business models can be replicated in Hong Kong.

**Q: What are the benefits of virtual banking license then?**

With a virtual banking license, one can leverage its balance sheet via fractional reserve banking, thereby magnifying the spread earned between deposits and loans. This also means that a virtual bank is going to be governed by the Basel regulatory framework whereby return on risk-weighted-assets plays a big role.

Given this background, the one business that is expected to generate a very healthy return on equity is small unsecured loans to retail customers, typically via credit cards. I would therefore expect Virtual Banks to introduce a fair amount of disruption in Hong Kong's consumer lending space which will serve as a wake-up call for most incumbent banks in the local market.

**Q: If traditional banks go big on digitization, will they have an advantage over smaller FinTech and virtual banking players?**

In theory, yes, but the reality is that most of the traditional banks are too large and structurally too rigid to implement digitalization effectively, not to mention the branch network is a key way for banks to acquire customers in Hong Kong. In terms of the technology, it is a huge task for a traditional bank to migrate or upgrade their systems. Perhaps the word that best encapsulates the various issues is "legacy".

The first legacy is with technology. Traditional banks' systems are extremely complicated and it would be quite catastrophic if anything went wrong. Any system changes come with a considerable cost, which together with the risk of any new system issues deters management from adopting aggressive changes.

The second legacy in traditional banks is the use of old manual processes. For one to optimize a process, the change itself will need to go through another long process with IT and compliance. While the existing process is not necessarily the most effective, sticking to the old way may not be a bad idea from the employees' perspective.

The third legacy is about people. For a young company like us, we do not have to hire traditional people in traditional roles. We can have a more open office, a more flexible corporate structure and focus our efforts on what matters the most: our customers. Our employees with no prior banking experience can truly think out of the box and their minds need not be constrained by those legacy processes. Bankers in traditional banks may not find it as easy for them to adapt to the new digital world.

**Q: You mentioned that Neat aims to explore a new customer base rather than competing over the existing banking customer base. Could you elaborate?**

Neat primarily targets young SMEs. According to our market research, there are two main customer groups which are being excluded from the banking system, starting from a market like Hong Kong: (1) migrant workers on the retail side; and (2) young SMEs on the corporate side. Similar to many other FinTech companies, we started off planning to target retail customers. But then we found that the migrant workers' group is already dominated by other companies focusing on remittances, which is the true pain point for that customer segment.

We studied the expense/payment patterns of our first batch of users and realized that many of them were using Neat as their corporate accounts. The main reason is SMEs with short business track-records are often denied by traditional banks in Hong Kong. We then pivoted our business model to focus on providing young SMEs with current account-related services.

## Challenger Banks in South Africa

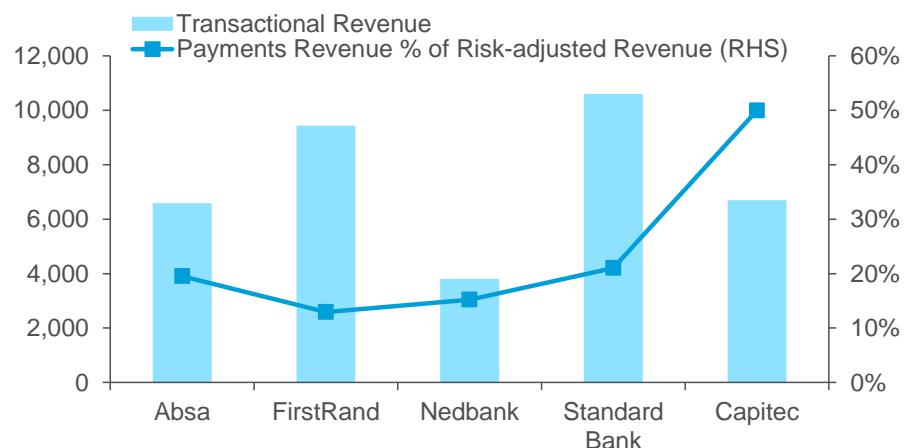
For almost two decades, most of which without any competition, four large banks have controlled nearly 90% of banking assets in South Africa. The “oligopoly” collectively banks approximately 31 million retail customers (out of nearly 38m adults). Over the past decade, Capitec has grown as a challenger bank, but more recently in 2017, three new banking licenses have been granted to digital-only banks.

### Rich Fee Pools

South Africa is quite unique in that retail bank charges are a meaningful portion of total non-interest revenue (NIR). We calculate that 30% of NIR and 19% of risk-adjusted revenue (net interest income (NII) + NIR – impairments) comes from retail bank charges.

This attractive revenue pool — nearly ZAR37 billion (\$2.6bn) — has lured three new banks into the market, with one having launched to the public in late 2018 (TYME Digital) and the other two expected to launch in the first half of 2019 (Discovery Bank and Bank Zero).

**Figure 30. Transactional and Payments Revenue of the Incumbents (Last Reported)**



Source: Company reports, Citi Research

### Incumbents Perceived as Digital Laggards

A further attraction for the new digital-only competitors is the belief that the incumbent banks are, or were, digital laggards.

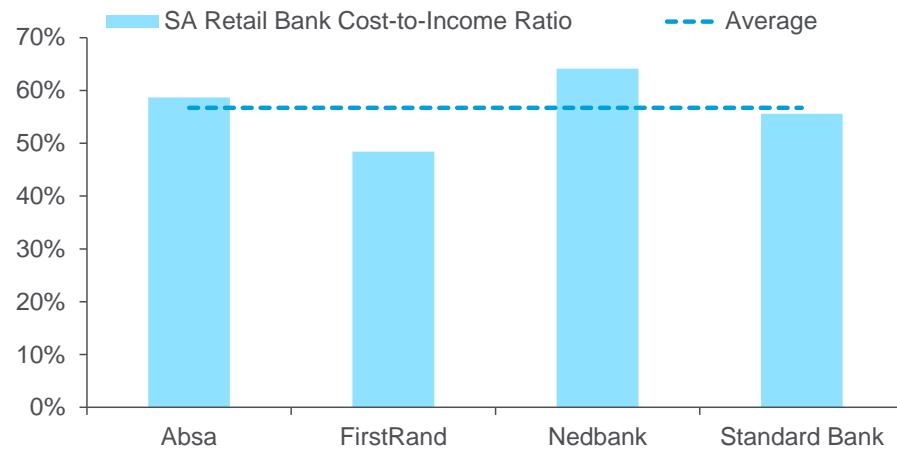
In 2017, we conducted a mystery shopping exercise to test the incumbent banks' ability to open accounts digitally, without human-intervention. Although some had embedded application forms into the bank websites, none were able to fulfill without either branch or telephonic contact.

In a separate exercise, we assessed the functionality of each of the banks' mobile apps, both relative to each other and relative to the best in the world. While we found the apps to be generally feature-rich, handling basic banking well, there were very few that could boast some of the latest and most innovative functionalities.

## High Fixed-Cost Bases

The Big-4 banks run relatively high cost-bases as is evidenced by the cost-to-income ratios below. As a comparison, Capitec (low-cost challenger bank) runs a cost-to-income ratio in the mid-thirties. These high cost-bases make it difficult to compete (or defend) on costs.

**Figure 31. Cost-to-Income Ratio for the Big-4 Banks' Retail Operations in South Africa**



Source: Company reports, Citi Research

## About the New Competitors

**TYME Digital** is 100% owned by Africa Rainbow Capital, a listed black-owned and controlled investment company in South Africa.

After launch in late 2018, TYME offers a transactional account with no monthly fees and generally free day-to-day banking. In addition, it offers high interest rates (up to 10% - REPO + 3.25%) on money set aside under GoalSave, a savings pocket.

TYME also facilitates low-fee money transfer between Pick n Pay and Boxer stores across South Africa. Customers are also able to access the TYME Coach app to get credit score info and tips to make better financial decisions. Over time, the bank plans to offer a full range of retail credit products including home loans, vehicle loans, personal loans, and credit cards.

Figure 32. TYME Everyday Banking Account – Website Snapshot

 <p>No Monthly fees. Pay-as-you-use charges</p> <p>Why pay to keep an account open, or pay for the banking you don't need?</p>	 <p>Open a bank account in less than 5 minutes</p> <p>Get your personalised TymeBank Visa debit card right away at the TymeBank kiosk in select Pick n Pay and Boxer stores.</p>	 <p>Save on your terms. In your own way.</p> <p>Our GoalSave tool lets you put money in, take money out, with no restrictions, fees or penalties. Leave it in a bit longer to earn as much as 10%* interest.</p>	 <p>Double Smart Shopper Points</p> <p>Your TymeBank Card earns you Smart Shopper points wherever you shop and double Smart Shopper points when you swipe and pay at Pick n Pay.</p>
 <p>No documents</p> <p>No filling out paper forms, no scanning, faxing or emailing. Opening and using your EveryDay account is really quick and easy.</p>	 <p>Low or no charges</p> <p>Withdraw money at Pick n Pay and Boxer tills for free, pay only R4 per deposit in PnP and Boxer and R8 per R1 000 to withdraw money at any ATM in SA.</p>	 <p>Free Visa debit card</p> <p>It's the only bank card you'll ever need, to shop everywhere and to withdraw money from any ATM in South Africa.</p>	

Source: Company website

The partnership with retailers gives the bank access to a physical footprint (and a location to drop TYME customer service kiosks) without carrying the full cost.

TYME is a relatively unknown brand, with limited customer trust at this point. However, it promises a 5-minute account opening process, with debit card immediately available through the kiosks in selected retailers.

**Discovery Bank** plans to launch in the first half of 2019 as the banking arm of the listed insurer, Discovery. It has a 20-year history of financial services (health insurance, wellness, life insurance, credit card, short-term insurance, and investments).

The model will work with the existing shared-value Vitality program, offering customers benefits (discounts and other rewards) based on their Vitality Health status. Healthier customers, as measured by wearable fitness devices, gym visits, races completed, etc. will benefit more than unhealthy customers. In turn, this reduces medical claims and delays claims for morbidity and mortality risks.

Discovery Bank does not plan to open any branches and already benefits from interacting with its active client base through its mobile app (supported by a call center). We anticipate that Discovery will continue to use this channel post-launch.

Along with a strong financial services brand, Discovery benefits from existing client relationships (about 300k credit card holders and over 3 million health insurance beneficiaries), making it a very credible threat to the upper-income customer bases of the Big-4 banks.

Discovery is likely to launch a transactional account (not expected to compete on price), take deposits and slowly move into retail credit over time.

Figure 33. Discovery Bank – Website Snapshot

## Bank healthier and get rewarded



**Dynamic Interest Rates**

Benefit from lower interest rates that flex monthly - get higher interest rates on savings and lower rates on credit.



**Boosted Vitality rewards**

Get even more out from our Vitality partners like up to 100% cash back on your gym membership, up to 75% off flights and up to 75% cash back on HealthyFood.



**Vitality Active Rewards**

Earn weekly rewards for your responsible spending.

Source: Company website

**Bank Zero** is also yet to launch (planned in the 2Q 2019) but aims to offer a free transactional account (with some fees charged for value-added services) and high deposit rates to individuals and SMEs through its mutual bank license. There is no aspiration to lend, believing that there is already too much credit in the South African system.

Bank Zero's founders (ex-CEO of First National Bank, the retail division of FirstRand, and the ex-Chief Information Officer of FNB) aim to keep the cost base ultra-low, currently operating with a staff complement of about 10 people.

The capital structure required for a traditional bank is 25x higher than that of a mutual bank. As such, it will still be possible to earn high returns on equity (ROEs) (which benefit the customer-shareholders in the mutual bank structure) without having to charge high fees.

Bank Zero has opted for a mainframe (rather than cloud) based core banking system, using open source software components. All services will be available via the yet-to-be launched mobile app.

Figure 34. Bank Zero – Website Snapshot



South Africa's newest bank

In a world of numbers, citizen Zero stands tall. Despite its importance, Zero arrived much later, yet now is pivotal to the number system. Some even say Zero is infinity. Bank Zero is the newest citizen in South Africa's banking world, pivotal to the new banking revolution.

Source: Company website

## Fee Structures

As is intuitive, low-cost digital-only competition is likely to disrupt the rich fee pools earned by the incumbents. In the table below, we show how TYME's fee structure (although not free as advertised at a headline level), is among the lowest in the market, especially at the 12 and 17 transactions per month level. Incumbent low-cost challenger, Capitec, is the cheapest at 25 and 30 transaction levels, indicating the strategy to grow in the middle market after exerting dominance in the lower-income segment already.

Discovery Bank is likely to buck the low-cost trend, and rather offer net low costs after taking into account rewards for customers meeting the desired levels of healthiness via the Vitality program.

**Figure 35. Bank Charges for a Range of Transactional Profiles**

	1st Place	2nd Place	3rd Place	4th Place	5th Place	6th Place	7th Place
12 Transactions	TYME R14.00	Capitec R17.85	Absa R28.33	Standard Bank R30.83	Nedbank R30.90	FNB R31.25	Old Mutual R32.30
17 Transactions	TYME R28.00	Capitec R30.00	Old Mutual R49.80	FNB R60.85	Absa R63.30	Nedbank R80.55	Standard Bank R122.30
25 Transactions	Capitec R49.95	TYME R60.00	Old Mutual R77.00	Standard Bank R106.43	Nedbank R107.00	FNB R111.25	Absa R112.22
30 Transactions	Capitec R51.90	TYME R74.00	Old Mutual R94.50	Absa R170.48	Nedbank R192.00	Standard Bank R203.37	FNB R206.50
Other Bank's ATMs (R2,500)	Old Mutual R8.50	Nedbank R11.00	Capitec R20.00	TYME R20.00	Absa R38.79	Standard Bank R44.47	FNB R47.00
Unsuccessful Debit Orders	TYME R4.00	Old Mutual R5.00	Capitec R6.00	FNB R20.00	Absa R55.44	Nedbank R60.00	Standard Bank R60.53

Source: Company Reports, Citi Research

# Incumbent Challenger Banks

## Incumbent Challengers: Oxymoron or Viable Model?

**“First they ignore you, then they laugh at you, then they fight you, then you win” – Mahatma Gandhi**

A lot of people have attributed the above quote to Mahatma Gandhi, the legendary Indian leader and non-violence campaigner; albeit there is no direct evidence that the Mahatma said those exact words. Some of the FinTech founders we have spoken to have expressed a similar sentiment – and even quoted the above sentence to us.

Incumbent banks in the early and mid-2010s were either ignoring FinTechs or they were laughing at them. The usual refrain was along the lines of: they are too small, no one knows them, they may have cool tech but they don't have any clients, they don't understand a regulated business, and so on.

However, over the past five years or so, especially since 2016-17, incumbent banks have moved from ignoring or mocking the new entrants to engaging with them and giving them the best testimonial possible: They have begun copying them by setting up their own new businesses.

So can an incumbent bank also be a challenger? Is this a viable business model or an oxymoron? To address this fundamental question, we consider the following factors:

**New Markets/Segments:** Marcus by Goldman Sachs is probably one of the best examples of an incumbent financial institution (corporate and institutional focused) launching a challenger brand to enter a new segment (mass market consumer financial services).

Examples of banks moving into new segments and in new geographies would include digibank, which allowed DBS to enter Indian and Indonesian consumer markets. Other Singaporean banks are now following this model, such as UOB and its new ASEAN challenger bank TMRW.

However, in most cases, incumbent banks launch a challenger bank in a market where they are already active; albeit they use their new proposition to better target a specific segment, e.g., millennials or digitally-savvy customers. B Bank by CYBG, Liv. by Emirates NBD or Pepper by Bank Leumi would fit this criteria.

**New Technology:** CYBG launched their B bank in the U.K. in 2016. While it had a new front end and to the average client the system appears to be real time, B Bank was built on the existing tech stack of CYBG with transactions batch reconciled every evening. Similarly, Liv was built on the same tech stack as ENBD.

Pepper was a half-way house: it did not use the existing Bank Leumi tech stack but used Temenos T24. So this was new for Leumi and allowed them to try out a new system in live production and later roll it out across the main bank. Pepper allows Leumi to experiment, albeit T24 is a system already used by incumbents elsewhere.

In the past 12-18 months, incumbent banks appear to be moving to consider more disruptive technology and business model approaches, and to attempt to actually build new brands or businesses “like a startup”. Examples of this would include RBS building its Mettle proposition with 11:FS or Standard Chartere'd Hong Kong virtual bank.

"If you aren't doing new tech, then stop calling yourself 'challenger' or FinTech. You are not challenging the status quo if you are using an existing tech stack. All you're doing is putting lipstick on a pig" – notes an industry source of ours.

**New Operating Model/Culture:** Banks can buy new technology. They can buy the latest technology. Of course, as we have argued before repeatedly, this does not make a bank a technology company – it simply makes the bank the biggest client of technology companies such as IBM and others.

"We have guys with earrings on our floor" I was told by a senior banker over lunch in Dubai recently. And "dudes with beards and t-shirts" texted another bank employee as we discussed whether incumbent banks can become challenger banks. It is a truth universally acknowledged that culture matters.

How does a bank do innovation but in a de-risked manner so it can also meet all its compliance and regulatory obligations? How does a bank combine a culture that is built on the foundation stones of preserving soundness and safety, and the control functions that go with this focus, also embrace change and innovation?

Bank employee incentives, training, and formation are the human capital equivalent of a fixed income instrument. By contrast, FinTech founders work and their employees are growth equity to the bank employees' fixed coupon bond. In the language of financial instruments, can banks become convertibles not just bonds?

To quote Vanessa Colella, Citi's CIO: Bank employees are trained and incentivized to swim in their lane, and now we need to make them play water polo. Changing institutional culture is a difficult challenge. And in our view most banks are in the early stages of this transformation journey.

One route to embracing operating model and cultural change is for the bank or incumbent financial institution to partner with a technology company in creating a new JV company. We see examples of this in Hong Kong with new virtual banks and also in other Asian markets. In the West, we have seen partnerships instead of equity JVs.

To explore further the opportunity – and the difficulties – of incumbents creating challenger banks we will in this chapter consider the examples of Marcus by Goldman Sachs, Liv vs Emirates NBD, meet with the CEOs of Pepper by Bank Leumi and Standard Charterd's new virtual bank in Hong Kong, and survey recent developments in various Asian markets, including China, Japan, Singapore, and Taiwan.

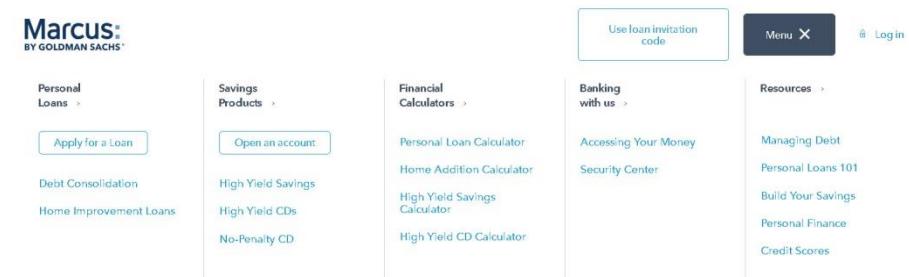
## Case Study: Marcus by Goldman Sachs - Expanding into Consumer

The name Marcus comes from the founder Marcus Goldman who founded Goldman Sachs back in 1869. In 2014, after 145 years in existence, Goldman Sachs decided to expand into a new business segment: consumer banking. Marcus currently has four products in the U.S.:

1. A consumer deposit product, offering one of the higher savings accounts rates in the U.S.
2. Wealth management and retirement.
3. An unsecured consumer loan portfolio focused on refinancing higher cost credit card debt.
4. Recently acquired personal financial management app, Clarity Money, which uses machine learning to provide actionable prompts.

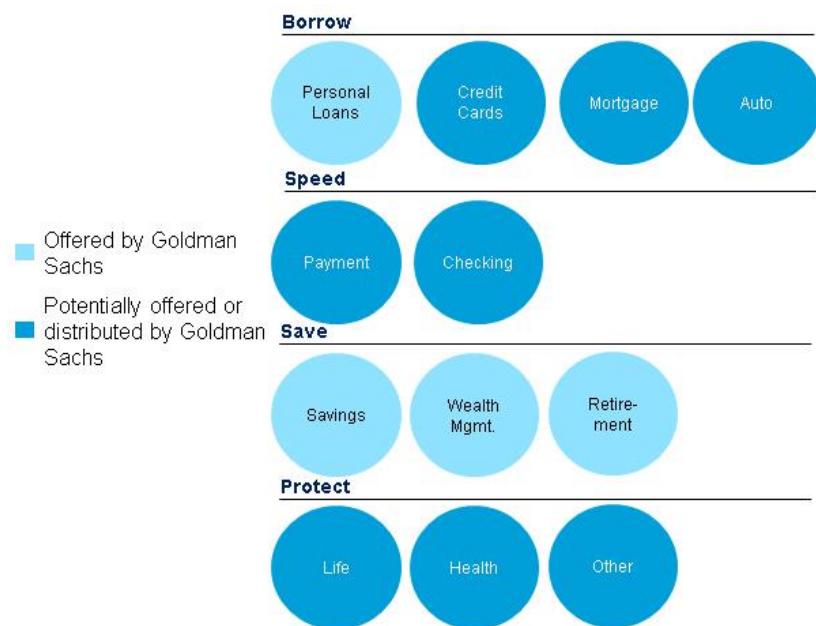
Marcus plans to enlarge its product portfolio gradually in offering credit cards, mortgages, auto loans, payments, checking accounts, life insurance, and health insurance. Goldman Sachs doesn't just want to be an "ING Direct" of today, a high rate deposit or limited product company. It wants to build a diversified consumer banking platform.

**Figure 36. Marcus – User Product Offerings on Website**



Source: Company website, 11:FS

Figure 37. Products and Services Offered and Potentially Offered by Marcus



Source: Company reports

### How is Marcus Different?

Prior to starting Marcus, Goldman surveyed 10,000 consumers to get a better understanding of the pain points, which form the basis for the business model. Consumers want transparency, simplicity, and no fees. They want a value proposition in the form of a favorable rate. And they want convenience.

How Marcus differentiated itself with other lenders or lending products on the block is by not charging any fees on the loan taken. There was no origination fee for the borrower, no prepayment fees, and no late fees. It was a quick hit amongst retail borrowers. They crossed the \$1 billion mark in just eight months of commencing operations and \$1.7 billion at the end of their first year post launch.

Figure 38. Marcus: Addressing a Clear Consumer Need

Key Pillars	Features	Marcus	Banks	FinTech Lenders
Value	Lower interest rate than credit cards	✓	✗	✓
	No origination fees	✓	✓	✗
	Payment flexibility for on-time payers	✓	✗	✗
Transparency	No late fees	✓	Some	✗
	No unsuccessful payment fees	✓	Some	✗
Customizable	Choose monthly payment amount upfront	✓	Some	✗
	Select payment date upfront and change it	✓	✓	Some
Simplicity	Automated online application	✓	✓	✓
	Simple language to explain product	✓	Some	Some

Source: Company reports

**Figure 39. Potential Market Share in Addressable Market**

Source: Company reports

### The Good and the Bad

Marcus offers higher rates on savings account compared to traditional banks and many other digital banks. It also offers attractive interest rates on CDs and no-penalty CDs where one can withdraw money after seven days of depositing money. Marcus provides no minimum balance savings account with zero maintenance fees, and free wire transfers to linked bank accounts.

The current product suite is relatively simple. Marcus has not rolled out a debit card or ATM card for cash withdrawals. Savings funds needs to be transferred to another bank account to be withdrawn. There is no checking account facility to access own cash and CDs renew automatically if no change is made during a 10-day grace period after their term expires.

If we look at the technology platform, Marcus is based on Infosys' well-known banking software Finacle compared to the newer, often in-house developed technology platforms at the new wave of challenger banks. It doesn't have a mobile app as yet, which other digital or challenger banks do have.

### Marcus versus Other U.K. Challengers

After a successful launch in U.S., Marcus launched only its savings account platform in the U.K. in 2018. U.K. deposits constitute 20% of the banks total \$35 billion in deposits at the end of 2018. Marcus believed that retail bankers are strapped at the wrong end of rates for a decade and launched Marcus, offering 1.5% interest rate on savings account with easy access and no fees on withdrawals. The launch of Marcus in the U.K. marked a competitive challenge to established banks and other challengers in the U.K.

Figure 40. Marcus: Online Savings Account Offering in the U.K.

The screenshot shows the Marcus by Goldman Sachs website. At the top, there is a dark header with the 'Marcus' logo and 'BY GOLDMAN SACHS'. On the right side of the header are 'Menu' and 'Hello' buttons. The main content area has a light background. It features a large heading 'Online Savings Account' with a small lock icon above it. Below the heading is a list of three benefits: 'Start saving with £1', 'No fees or charges', and '1.50% AER\* (variable)'. A note below the list states 'Includes a bonus rate of 0.15% gross<sup>†</sup> fixed for the first 12 months'. At the bottom of the page, there is a small note: '\*AER stands for Annual Equivalent Rate and illustrates what the interest rate would be if interest was paid and compounded once each year.' and '<sup>†</sup>Gross is the interest rate payable before tax is deducted.'

Source: Company website, 11:FS

## Early Mover in Building an Incumbent Challenger Bank

### Interview with Michal Kissos Herzog of Pepper

**Michal Kissos Herzog** is the CEO of Pepper, Israel's first mobile-only bank. Prior to her current role, she was the Head of Innovation and Digital at Pepper's parent, Bank Leumi.

#### About Pepper

Pepper, Israel's only 100% mobile banking platform, was officially launched in mid-2017 by Bank Leumi. The intuitively designed Pepper helps customers make the most of their money through personalized insights and optimized services. With Pepper, users can do everything they expect from a traditional bank - including checking accounts, credit cards, loans, checkbooks, savings accounts, and fund transfers - but with the opportunity of doing it easily and friendly where and when they want via mobile.

#### Q: What is the original story of Pepper? Why was it set up and what was the business case?

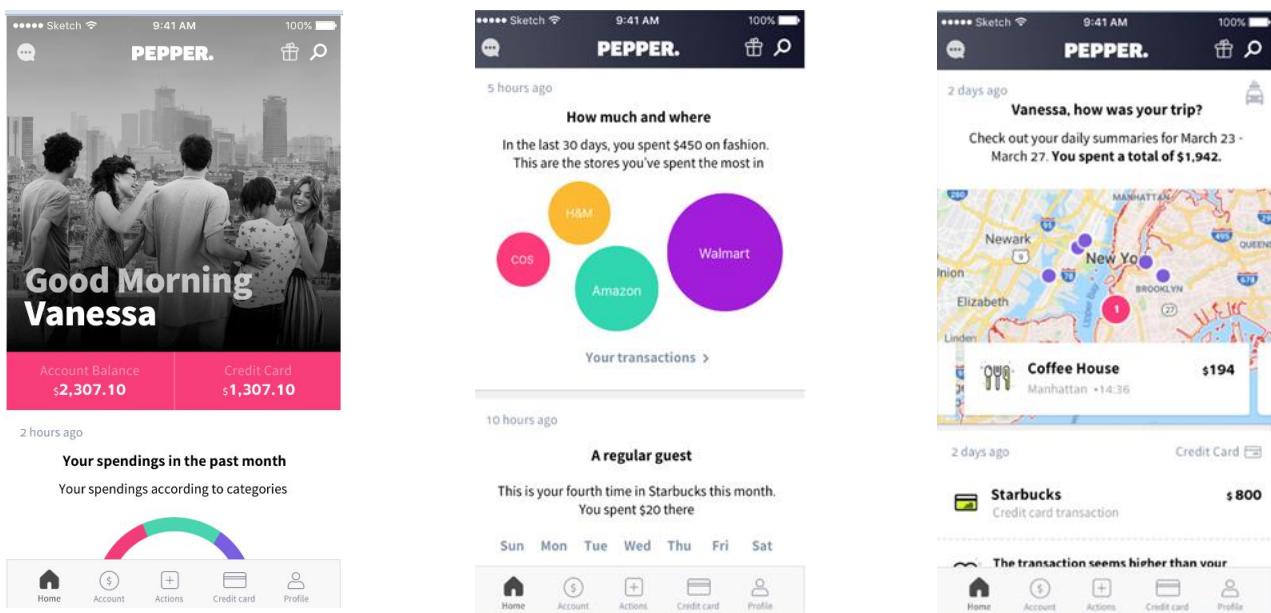
Technology continues to radically shape the way customers interact with their bank. Increasing regulation and legislation, evolving customer needs and demands, and technological advancements are just some of the obstacles banks, including Bank Leumi, continue to face. At Pepper, we recognized that the banks which will 'stand the test of time' and continue to meet the developing needs of customers need to be digital to their core; applying a digital skin over an existing platform does not go far enough. So, we built an entirely new banking system – from the ground up (i.e. core systems/infrastructure).

#### Q: How is Pepper different from Bank Leumi?

Pepper was created within Bank Leumi, but it is a completely different banking experience – and this is due to the technology behind it. Bank Leumi is a 117-year-old incumbent bank built on the IBM mainframe system; while Pepper is built on the new T24 platform by Temenos. The latter offers strong scaling benefits enabling Pepper to be: fast (much quicker time to market), personal (Pepper uses contextual AI to create and optimize services in real time), and intuitive (with a Facebook-style design).

Pepper is not just about user experience. It's not just a bank — it is a banking value proposition built on a great user experience. But we believe it's more than that. Our main differentiator is the use of data for the benefit of the customer, not the organization. Companies often use data for things like process optimization, sales marketing, and cyber. They rarely use it for the direct benefit of the customer. At Pepper we will use data to recommend what is suitable for each customer.

Figure 41. Pepper Bank App: Provides Everything Customers Need: Simple, Intelligent, Personal Account Mgmt., Savings, Loans, and Much More



Source: Company website

#### **Q: What does the near-term to long-term journey look like for Pepper?**

The question we at Leumi Group are asked often is: "What is the need for a bank who is an innovator with a significantly large market share to setup a new digital platform?" The answer lies in looking at the next 10 years of banking.

While our immediate goal at Pepper is focused on the millennial acquisition strategy (i.e., offer different customer experiences to meet millennial customers' demands and build loyalty), being an agile bank ready to react to the next banking disruption, we will continue to future-proof Bank Leumi for years to come.

#### **Q: Given the fact that banking is different than other industries, where do you think the banking industry is vis-à-vis the tipping point of accelerating change in the banking industry?**

There are primarily three Cs as to why banking is different from other industries: (1) complicated regulations; (2) complicated technology; and (3) customer trust. Despite customer trust being a pre-requisite for banks' success, we're yet to see some highly innovative challenger banks, with strong infrastructure, partnering with incumbent banks to help build that customer trust. In addition, banking regulations are complex and are rapidly evolving, and this too is a 'C' accelerating change in the industry.

For example, PSD2/Open Banking is driving competition in the sector because customer data is no longer exclusive to one bank. At Pepper, we are a firm believer in collaboration, whether it's with FinTechs, banks, tech companies or with players from other sectors. Pepper is in a strong position to partner with other stakeholders thanks to its agile platform which can handle integrating with complicated technology.

**Q: How easy or difficult it is to take your learnings from the new brand and cross-pollinate the ideas with the larger parent bank?**

We think we have two strong brands — Bank Leumi, a large traditional bank with a strong digital offering, and Pepper a new digital bank offering. We believe both brands will continue to grow in parallel over the coming years. We are not looking to bring the two brands together in any form and Bank Leumi will continue to remain a digital leader in its own right.

It is often cited that companies which are market leaders tend not to innovate for fear of disrupting their existing profit-making business or potentially losing market share. However, what makes Bank Leumi stand out from the rest is that we think differently.

**Q: Which digital banks were your role models when you were starting Pepper? Why did you choose Temenos for building your core systems?**

Five years ago, when developing Pepper, we looked at digital banks considered leaders in the field at that time – not traditional banks which had added a ‘digital layer’. In our opinion, building Pepper on the same core systems as our incumbent parent, Bank Leumi, would have resulted in immense challenges, especially when looking to scale the business. Therefore, at Pepper, we took the conscious decision to build our core system independently from our parent bank. Moreover, we started Pepper with a full-suite of banking services and not just a handful of select products – positioning us as a player with a strong banking offering.

At the time we created Pepper, Temenos was the only ‘back end’ technology platform offering a full-suite banking product. However, to this day Temenos offers a wide range of core products to build a bank that is digital at its core. While Temenos takes care of Pepper behind the scenes, our front-end was and continues to be built by the strong team of tech employees within Pepper (which includes developers, designers etc.), enabling the bank to meet our value proposition and desired customer experiences.

**Q: If you were launching a new digital bank today, would you have a different approach to what you adopted earlier?**

If we were building a new digital bank in 2019, our approach would remain largely unchanged. Of course, the process would be much more efficient having already gone through a digital transformation project and our role models would be different – as we’d cautiously look beyond banking players. But our choice to be digital to our core — using Temenos — would remain.

**Q: Are you looking to expand the Pepper experience internationally?**

At present, Pepper is offered only within Israel. We cannot provide details on our expansion plans. However, what we can say is – there is a lot of interest globally from other players, not just financial institutions.

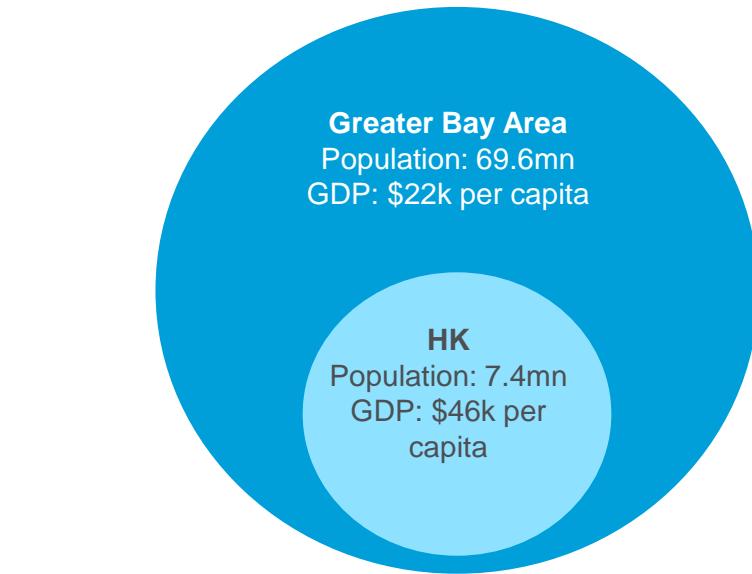
## Case Study: Standard Chartered - New Hong Kong Virtual Bank

Standard Chartered (STAN) is the only incumbent, large Hong Kong bank that applied for a Hong Kong virtual banking license. While the incumbent could operate Internet banking with the existing license, virtual banking allows STAN to move away from legacy cost base and build new, more efficient digital banking services from scratch. The new license also enables STAN to partner with TMT or other non-financial companies that may be able to help it broaden its offering and embrace change faster.

STAN's virtual bank could also help the bank expand its client base deeper into the digitally-savvy younger generation and potentially grow its market share. STAN already has a wide range of banking products. The new virtual bank will be a cost efficient way to enhance STAN's distribution. STAN's retail banking cost-to-income ratio (CIR) is higher than other larger Hong Kong banks. If proven successful, STAN's virtual banking model would be a solution to the bank's cost efficiency problem in Hong Kong or even globally.

STAN's digital ambition is not bound by geography — Hong Kong is just a starting point. A key question for Hong Kong virtual banks is whether they can on-board clients outside of Hong Kong remotely, which is unlikely initially, but may change over time. If Hong Kong virtual banks are allowed to acquire customers in the Greater Bay Area, it will open up a much larger business opportunities given that the population is nearly ten times that of Hong Kong alone.

Figure 42. Greater Bay Area Presents a Larger Business Opportunity



Source: HK Constitutional and Mainland Affairs Bureau, Citi Research

## Building a Virtual Bank

### Interview with Deniz Güven of Standard Chartered Hong Kong Virtual Bank

**Deniz Güven** is the CEO for the Standard Chartered Hong Kong Virtual Bank. Prior to joining Standard Chartered in May 2017, as its global head of design and client experience for retail banking, Deniz worked at BBVA Group's Garanti Bank in Turkey mainly focused on its digital development.

#### About Standard Chartered Virtual Bank

Standard Chartered (STAN) announced its plans to launch a new virtual bank — a separate entity from its Hong Kong retail bank — in 2018 after the Hong Kong Monetary Authority announced plans to issue new virtual bank licenses to traditional and non-traditional banks.

#### Q: Why is STAN setting up a Virtual Bank in Hong Kong?

We are not just setting up a virtual bank, we are creating a future operating model. STAN currently focuses on the affluent customer and enjoys good market share in Hong Kong. However, there is a rapidly growing market of mass & emerging affluent customers to whom our bank couldn't serve a significant value proposition in terms of products and services they desired.

We wanted to tap this market segment very differently so that profitability and market share remains high. The new age customers use digital platforms that make their life simpler and when the HKMA started with the initiative to setup virtual banks in November 2017 we saw opportunity there.

We want to help customers solve their pain points with smart service instead of traditional products. We are re-thinking our risk frameworks, policies, and standards for this new operating model.

We at STAN believed that with the help of the right technology and product, we can create a different value proposition for the mass & emerging affluent customer base. As part of the new digital bank, we were not just looking to create a new digital user interface (UI) or apply different marketing techniques.

Instead we wanted to create a new future operating model with new technology and end-to-end digital systems. Of course we are looking at carrying over our existing knowledge from the main business (i.e., huge experience on risk models, credit frameworks etc.), but we are focusing on re-thinking our approach on technology, customer onboarding, culture, products etc.

#### Q: How different is the Hong Kong virtual bank form the African digital banks STAN has established?

The African model is very different from our proposed Hong Kong offering. In Africa, we don't have an independent digital entity. The bank has leveraged its existing technology to create end-to-end digital channels and content to capture customers digitally. We use the STAN brand to on-board customers digitally.

Meanwhile the Hong Kong virtual bank is a separate entity with a separate license and an independent unique brand with a new positioning.

**Q: What are the main differences between the new virtual bank and legacy STAN — people, culture, tech, policies etc.**

If you want to run a digital bank — it has to be available all the time (there's no option for downtime) and it has to be cheaper than running a traditional bank. At STAN's new virtual bank, everything will be on the cloud and unified on a single open platform.

In fact there will be no core banking system, like at traditional banks. Instead there will be a product engine, which will help create new products/services on-demand and roll them out even daily. The new banking system will be agile and allow for new product/services to be offered instantly.

By contrast, making these changes on traditional core banking systems could take months. The challenge with traditional core banking systems is that they are legacy in nature with several complicated layers and with years of patch-work to add new functionality/services.

In a traditional setup, one could find as many as six or seven different systems with a common messaging platform that helps tie them all together. For instance, when a customer requests a new product — the message would go from the product system to the accounting system to the risk/credit system and so on. This layering makes any alterations more complicated.

**Q: Who are the partners you are working with to establish the Hong Kong Bank? Are you buying tech off-the-shelf or a modular approach and building from scratch?**

We are partnering with 15 different players to build our virtual bank platform which we aim at to be very independent, agile, and scalable. This would allow us to easily extend our offering to other markets in the future. Monzo had also preferred to partner with several other players rather than buying one standard off-the-shelf platform.

Of course, there are pros and cons to either approach, but we believe our approach of partnering helps us create much more independence on the platform, which we think is very crucial. Ninety percent of processes/platform has no dependency.

**Q: The product range of Monzo is pretty limited compared to other traditional banks. Are there any other existing players like you offering more broad-based product lines?**

Our approach at the virtual bank is not to just about creating new products for customers by simplifying existing processes. We also build upon a collection of micro-services, where customers will be able to do several different banking functions as part of their day-to-day needs.

**Q: What has been the biggest challenge in setting up the new Hong Kong bank?**

There were quite a few challenges, but most of them were anticipated ones, just more or less in magnitude. Finding the right talent in Hong Kong was the biggest challenge so far in setting up virtual bank. It was difficult to find someone with a strong understanding of banking products/services and who is also able to do computer coding.

To put things in perspective, it took us nearly seven months to find a single candidate for a particular role, which would have taken some 45 days in markets like London or San Francisco. There is some talent pool with desired experience available in China, particularly around Shenzhen, but they prefer to work with bigger technology companies in China. Hong Kong's higher living costs are also a deterrent for some. However, we believe we will be able to overcome this challenge after our virtual bank gains scale and strong independent brand recognition.

**Q: Would it be easier to set up a new digital standalone bank brand vs. some kind of branding with the parent traditional bank?**

Traditional banks tend to have a strong brand recall with customers, which would be crucial while setting up a new digital bank created from scratch. However, this does not mean that every digital bank created without partnering with an incumbent traditional bank is unlikely to be successful.

I believe the decision of whether to partner or not with a traditional bank also depends on the product offering of the new digital bank. Take for instance, if the digital bank were to do only credit cards and lending products, a strong incumbent partner may not always be necessary.

By contrast, if say the bank were looking to offer deposit and other banking products, a traditional bank partner would help establish trust and build an initial customer base.

**Q: What is the staff strength of the new virtual bank? How much of this staff has come from the parent Standard Chartered bank?**

We have current staff strength of about 70 people working for the new virtual bank. Much of this has been hired externally and includes key positions in technology. However, over 20% of our staff has been hired from our parent bank, i.e. Standard Chartered, and these include people primarily in our product functions.

**Q: Are there successful existing examples of challenger banks?**

I think the best example would be of N26 in Germany. N26 started off as an aggregator in Berlin, a very small market. Today, they offer end-to-end digital onboarding, allowing customers to onboard from several different markets.

Although N26 offers products from several different providers, its success comes from its focus on differentiated services and appropriate design languages and the marketing campaigns it employs to attract customers. I believe marketing plays crucial role in the success of any digital bank, however, it is often overlooked/underestimated.

**Q: Are non-banks better placed to launch successful challenger banks, especially in markets like the U.S., the U.K., Singapore or Hong Kong?**

I think there are two specific criteria to be considered here:

1. Engagement: If the non-bank has the right engagement with customers, offering contextual proposition, then that player is likely to be extremely successful in launching a challenger/digital bank. For example Kakao in South Korea, has users highly engaged on the platform, checking the app multiple times a day and engaging in several different topics including finance. It was therefore relatively easy for Kakao to gain success when it introduced its new digital bank offering.

2. Trust: Non-bank players often do not have enough customer trust for dealing in banking functions, such as taking deposits. This stems from customer apprehension around security, perception, and data privacy. I believe if any non-bank has a strong contextual engagement model and the necessary customer trust, the player would be a position to launch a successful challenger bank.

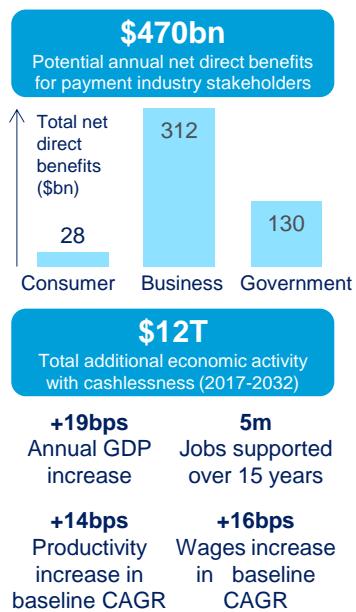
## Incumbent-led Challenger Banks in Singapore

Singapore is regarded as one of the more advanced digital transformation banking sectors in Asia. Key factors have been:

- Recognizing early the threat of emerging Internet finance platforms;
- Investing for more than a decade in upgrading legacy technology stacks to compete against Internet giants and providing the platform for new digital strategies and FinTech partnerships;
- Digital transformation led from the CEO down, cultural change as important as technology change;
- Highly supportive regulator/government whose “Smart City” agenda includes driving cashless payments and national digital identities; and
- The launch of digital-only banks as a low cost way to tap into regional growth and new customer segments (e.g., millennials).

## Financial Services in the Singapore Smart City

**Figure 43. Economic Benefits of Cities Moving from Cash to Digital**



Source: “Cashless Cities: Realizing the Benefits of Digital Payments”, a study by Visa and Roubini ThoughtLab on 100 cities.

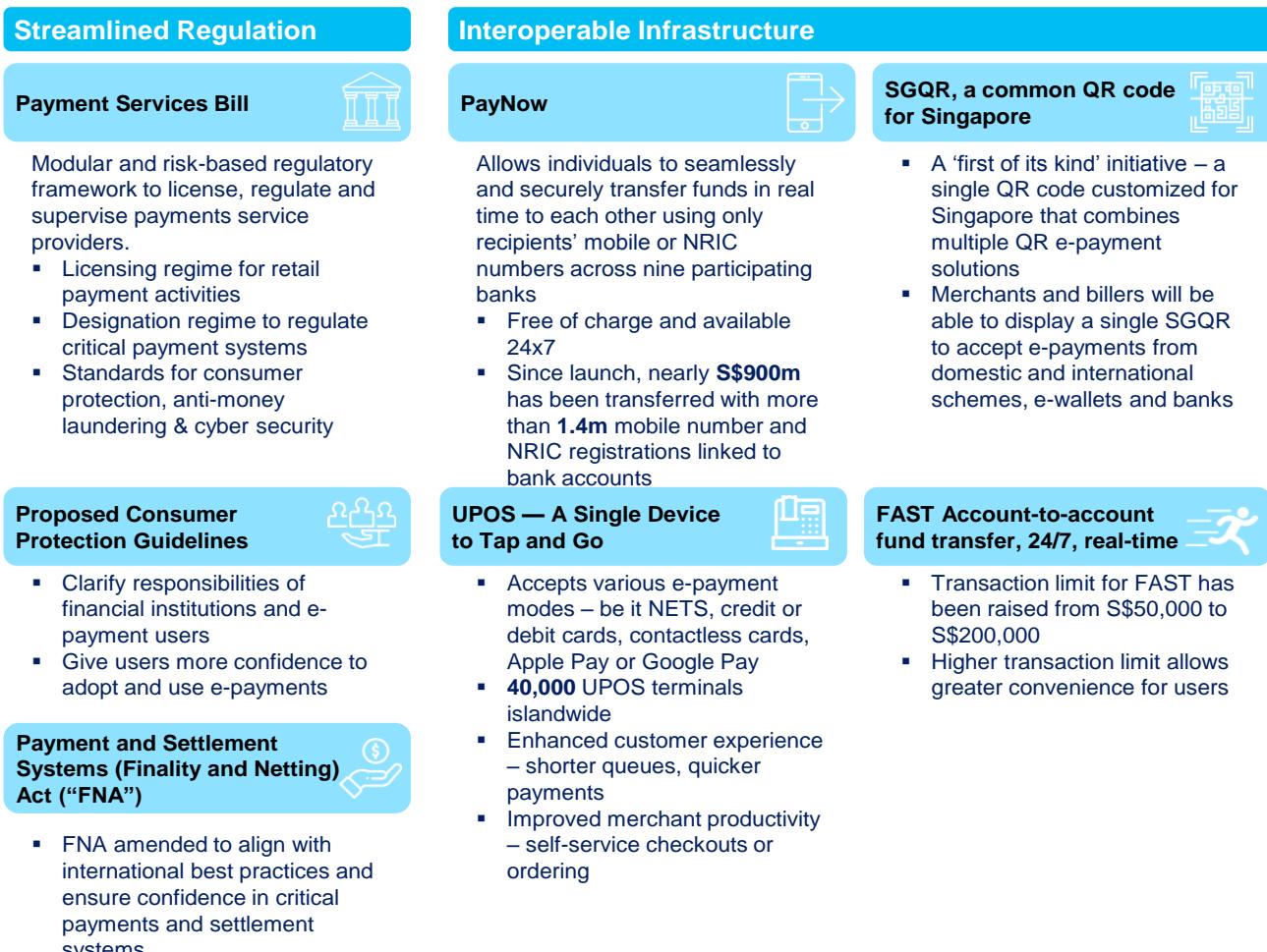
Singapore’s Smart Nation push aims to transform the economy, government, and society with the goal of augmenting its residents’ lives via technology. Five strategic national project focus areas were identified with two relating to financial services, namely national digital identity and e-payments, underscoring Singapore’s aspiration is to become a fully cashless society.

For decades Singapore has operated credit cards, debit cards (“NETS”) and also contactless smartcard payments (“EZ-Link” for public transport) though surprisingly cash usage is still relatively high, especially for small SME and consumer micro-payments (such as hawker food centers, and P2P payment), plus there remains “last mile” payment frictions on e-commerce.

With Singapore’s Internet access rate of 100% and smartphone ownership of over 95%, Singapore looks well positioned to fully migrate to cashless transactions. Singapore thus launched a series of digital payment initiatives:

- **SGQR:** To allow acceptance of multiple domestic and international e-payment schemes, e-wallet, and banks under a single QR label creating interoperability.
- **UPOS:** Unified point of sale terminals accepts multiple forms of e-payments including the likes of Apple Pay and Google Pay.
- **PayNow:** Provides users the ability to send instantaneous peer-to-peer (P2P) payments by keying in the mobile number of an intended recipient using the interbank network, FAST. In late 2018 it was announced FAST would be opened up to e-wallets, boosting interoperability.
- **Account-based ticketing:** Enables credit card schemes to be used on public transport, increasing interoperability for credit cards.

Figure 44. Singapore Electronic Payments Overview



Source: MAS, Citi Research

## Central Bank Regulation: Balancing Innovation with Stability and Security

The Monetary Authority of Singapore (MAS) has laid out a Financial Services Industry Transformation Map, encompassing business strategies (e.g., wealth and fund management, capital markets, and insurance), innovation and regulation (e.g., providing a regulatory sandbox, and using technology to simplify regulatory compliance) and upgrading jobs and skills in the financial sector.

MAS has also actively encouraged the development of a FinTech ecosystem, with several hundred FinTech startups, over 30 innovation labs, and more than 270 APIs from financial institutions. MAS provide grants to support development of artificial intelligence and data analytics, and Singapore hosts an international "FinTech Festival" which recently had representation from over 100 countries.

Balancing this fostering of innovation MAS remains a regulator highly concerned with financial sector stability and security. Cybersecurity/resilience is a key agenda item, and MAS has been proactive on issues such as cryptocurrencies and initial coin offerings (ICOs), distributed ledger technology (DLT) and Blockchain, including

work on its own DLT prototype for interbank payment, promoting clear regulatory sandbox guidelines.

The publishing of a Payment Services Bill in 2018 regulates the activities of digital payments to safeguard consumers' money and look to counter terrorism financing, and this Bill is expected to affect the potential activity scope of numerous e-wallets and digital payment services such as GrabPay.

A consequence of this is that banks will, in our view, remain the center/core of the Singapore financial ecosystem, especially around the important issue of customer deposits.

### **DBS — “World’s Best Digital Bank”**

DBS’ thinking around digital transformation focuses on three broad areas:

- Digitally disrupt its traditional banking so that it offers best in class customer experience so that customers would not want to migrate to new platforms;
- Achieve cost efficiency by either driving new revenue streams through digital channels or manage revenue pressures by driving down unit costs; and
- Develop a pure digital bank platform to penetrate new growth markets (currently India and Indonesia) as a “challenger bank”.

DBS has been named by Euromoney as the “World’s Best Digital Bank” in two of the three years since this category existed from 2016. That accolade was earned due to DBS’ pervasive, firm-wide digital transformation, including the changing culture of the bank and measurable metrics of digital-led revenues, costs, and (for the retail bank) a digital versus traditional profit & loss which showed substantially higher unit revenues earned from a digital customer versus a traditional one.

### **Brief Review of Digital Transformation Strategy**

From 2014-2017, DBS saw significant progress in the tangible metrics of its digital customers and at its 2017 investor day elucidated its “Digital to the core” strategy for firm-wide pervasive change which was not just “digital lipstick”: it included business units, back office, employee culture and formal scorecard KPIs.

In particular, given the cost-income ratio for the digital core consumer/SME customers was just 36%, this suggested that further migration from traditional to digital customers could imply structurally lower cost ratios.

Key digital capabilities included (1) acquisition (customer acquisition via wider distribution at lower cost), (2) transaction (eliminate paper, instant fulfilment), (3) engagement (“sticky” customer behavior, raise income per customer), (4) ecosystems (pipes to platforms, partnerships), and (5) data (drive insights and customer cross sell).

The tech strategy at DBS for digital was to create a cloud native technology stack that is cost efficient, nimble in time to market, and supports ecosystems/open APIs for deeper client engagement. The goal was set to make banking invisible by embedding into the customer journey/experience and to foster a startup mentality in employees to drive customer journey thinking.

**Figure 45. Pre-empt Disruptors: Core SG-HK Consumers/SME 2017 – Superior Digital metrics for Digital (D) vs. Traditional (T)**

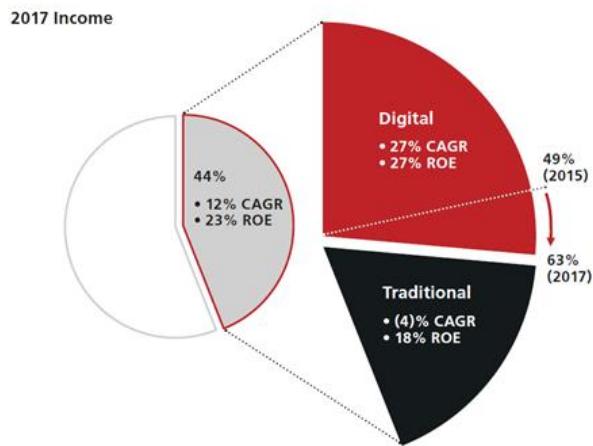
<b>Profit and Loss (\$\$bn)</b>		
Customers (m)	2.5	3.5
Income	3.3	1.9
Costs	1.2	1.2
Profit before allowances	2.1	0.8
<b>Key Indicators</b>		
Income per customer (\$\$'000s)	1.3	0.7
CIR (%)	36	58
ROE (%)	27	18

Source: Company reports, Citi Research

## Digital Strategy Catered to Business Units

■ **Pre-empt disruptors by disrupting itself:** DBS has disrupted itself for its core Singapore-Hong Kong retail/SME segment for instance via PayLah, a mobile wallet for P2P payments that has integrated with selected merchants for in-app online-to-offline (O2O) applications. In 2017, digital customers were 42% of the total, provided twice as much income per customer as traditional customers, and had a return on equity of 27%, +9pp higher than traditional customers. DBS targets: 50-60% of customers to come from digital with the core bank contributing half of group income and driving the group cost-income ratio below 40%.

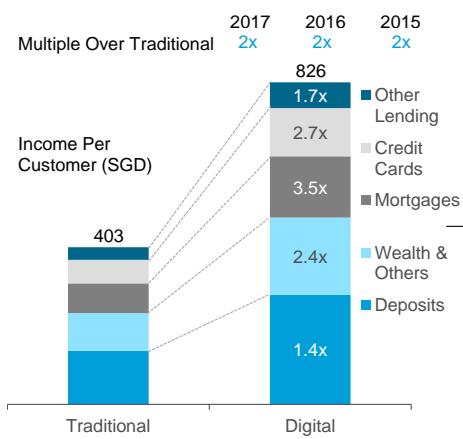
**Figure 46. DBS Consumer SME (SG, HK) Business: In 2017, 42% of Customers Were Digital, Driving 63% of Segment Revenues Delivering a 27% RoE**



Source: Company reports

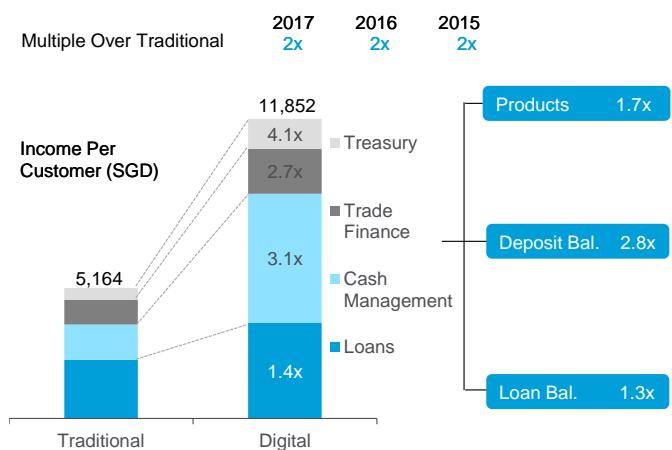
■ **Digitalize for profitability:** For the corporate bank, markets, and other segments, DBS aims to digitalize and reduce costs with a goal of ~10% ROE.

**Figure 47. DBS Consumer Metrics for Digital\***



\* Latest data: 2017  
Source: Company reports

**Figure 48. DBS SME Metrics for Digital\***



\* Latest data: 2017  
Source: Company reports

## DBS Digibank — Standalone Digital Bank

- **Pure digital bank to penetrate new growth markets:** Having historically failed to make a material expansion into the growth market of Indonesia through traditional “bricks & mortar” M&A, in April 2016, DBS launched digibank a “bank in a smartphone” in India and in August 2017 launched digibank in Indonesia.

At the time DBS considered this a digital customer acquisition and distribution model that could operate at <30% of the cost of a traditional brick-and-mortar bank targeted at consumer/SME in growth markets. The initial “proof of concept” was to show that a pure online bank could generate a sustainable customer deposit franchise. From there monetization could come by building an asset book to utilize the funding.

- **Solid customer acquisition but refining the growth strategy:** In February 2019 DBS reported that digibank India had garnered 2.3 million customers and digibank Indonesia 400k, but qualitatively Indonesia is in some ways showing better progress in that it is more profitable and has a better customer profile. digibank Indonesia was rolled out at 40% less cost than India.

Initially in India, digibank was after customer numbers, but has deliberately reduced customer acquisition from 80k per month to 40k per month. Indonesia from the start had more targeted customer segmentation with a view we assume to garner a larger customer wallet.

Prevailing interest rates also make it easier to make a spread on “free funds” in Indonesia (approximately 3% vs 60bps in India). Additionally digibank Indonesia has also to some extent benefited from DBS Indonesia’s 40-branch presence.

- **Monetization and asset strategy:** With proof of concept on customer acquisition achieved, from 2017 DBS sought to build on the asset side of the business. In 2018 digibank India was offering payments products (utilizing UPI, Bharat QR), investment products, and some lending products.

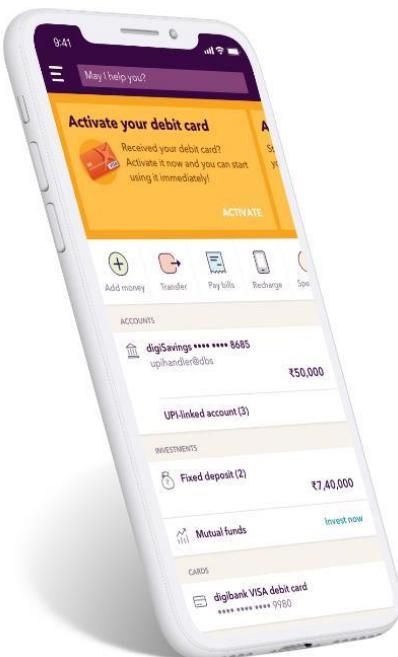
Mid-2017 DBS announced a tie-up with Tally, a leading enterprise resource planning company in India’s SME space with 8 million SMEs and 30,000 salespersons. This has given DBS access to thousands of SME customers to provide both secured and unsecured loans.

Although operating for a shorter time, digibank Indonesia already offers via its mobile app credit cards and personal loans.

- **India wholly-owned subsidiary from March 2019:** In 2018 DBS obtained the license to convert its India operation into a full subsidiary, effective March 2019. From an existing network of 12 branches in 12 cities, DBS plans to open six branches in March and up to 12 by end 2019 plus ~60 kiosks targeting 30-35 SME locations and some corporate business parks, likely reaching 30 cities by the end of 2019 and 80-100 “points of presence” including branches and kiosks.

The intent is to grow the SME and retail book more aggressively versus the existing portfolio which is more corporate dominated. The additional points of presence will be a boost for digibank since under local regulation DBS can only make a digital offering in a city where it has a physical presence.

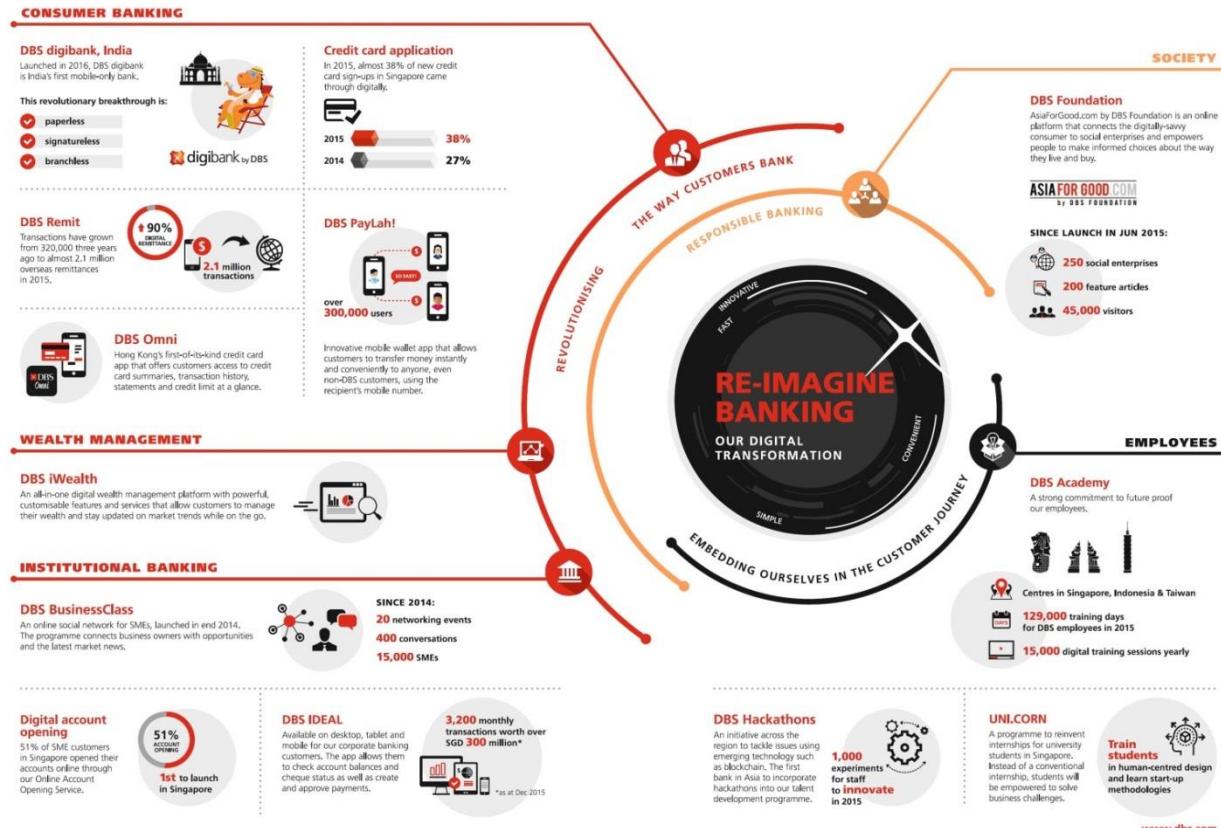
Figure 49. DBS Digibank: A Bank in a Smartphone



Source: Company reports

■ **Expanding into more growth markets?** Further launches of digibank would likely be where DBS already has a standalone banking license and where the competition is not yet too intense. Hong Kong (under DBS' existing bank license) may be an option plus there is a growth opportunity with mass affluent Mainland China customers. Another possible location in the medium term is Vietnam. The Philippines look unlikely as DBS does not have a banking license there.

Figure 50. DBS: Re-Imagine Banking Overview



Note: DBS' original overviews of its digital transformation in 2016  
 Source: Company report

Figure 51. DBS Launches API Platform November 2017

**{ Reimagining banking, DBS launches the world's largest API developer platform }**

**< Geek Speak / >**

// What is an Application Programming Interface (API)?

APIs are simply software programming instructions, tools and standards used to build web-based software applications that you can access on your phone, computer and point of payment terminals.

A company usually releases an API so that other companies, SMEs and software developers can easily design solutions and products powered by its services.

**< What do APIs have to do with you and I? / >**

// It makes our lives simpler and more convenient ■

**Instant redemption of reward points** without the hassle of physical vouchers and emails.  
**e.g.: Homage**  
 Redeem a free Care Assessment for aging loved ones to determine their home care needs and requirements.

**Funds transfer**  
**e.g.: soCash**  
 All our customers can now skip the queues at DBS/POSB ATMs as they can get access to cash withdrawal points at all SPH Buzz kiosks and other convenience stores and newsstands at bus interchanges, bus stops and MRT stations.

**PayLah! your way to a good meal**  
**e.g.: McDonald's**  
 Use PayLah! to pay for meals 24/7.

**Home planner**  
**e.g.: PropertyGuru**  
 Hunting for a property doesn't need to be so daunting. House hunters can now get an instant affordability assessment from DBS through PropertyGuru as they are able to calculate if they can afford the house that they are viewing on propertyguru.com.

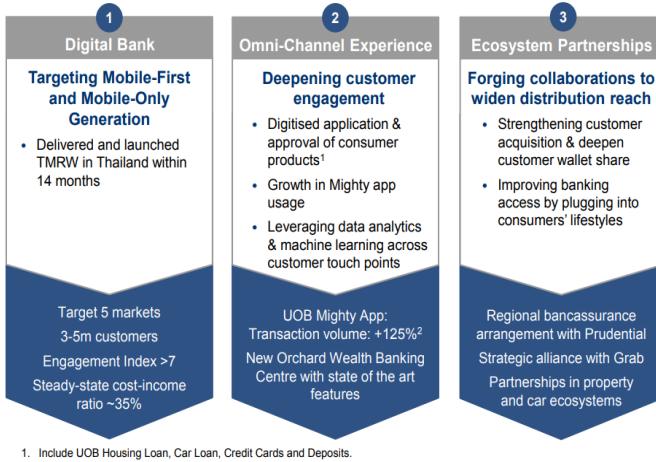
Source: Company reports

### UOB — Three-Pronged Digital Banking Strategy

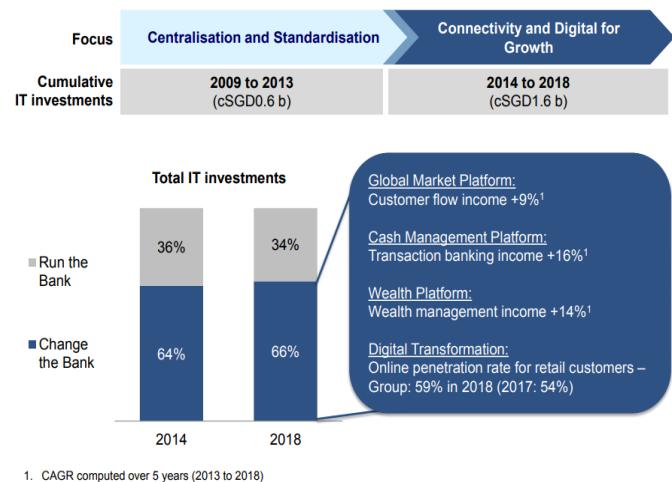
Although UOB is considered by some investors to be lagging its Singapore peers, the bank has been investing heavily in technology for the past decade. The five years from 2009 to 2013 were mainly focused on standardizing the banks IT platform to a common architecture across its regional network (now totaling >500 offices) which allowed standardization of processes/faster time to market in roll-out of new products. From 2014 onward, UOB has moved towards digital transformation, which the bank sees as a three-pronged strategy.

■ **Omni-channel experience:** For the existing bank the core goal has been to deepen customer engagement and drive efficiency through offering an omni-channel experience and digitizing the banking process. UOB launched its mobile banking app called "UOB Mighty" in 2015 and in subsequent years led the way on a number of key digital developments, including offering contactless payment via smartphone, instant digital credit card issuance through the smartphone, contactless ATM withdrawals, use of the smartphone as a digital security token, and offering a full suite of dining services integrated into the Mighty Banking app. By the end of 2018, UOB Mighty had 1.5 million downloads with rising usage and transaction volumes up +125% YoY to around 100 million.

■ **Ecosystem and partnerships:** UOB has engaged in key collaborations with digital as the common goal. In mid-2018, UOB launched a digital ecosystem for both car and home purchases, the latter tying up with Singapore's top four property agencies offering a bank-backed property valuation tool and an instant home loan approval service. In late 2018, UOB entered into an Alliance with Grab, where UOB will be Grab's preferred banking partner in Singapore, and a strategic credit card partner in SE Asia. In early 2019, UOB renewed its bancassurance tie-up with Prudential for a further 15 years from 2020, with leveraging of digital capabilities to offer protection policies a common goal. UOB also rolled out a number of digital solutions to help its core SME customer base.

**Figure 52. UOB Digital Initiatives: Three-Pronged Strategy**

Source: Company reports

**Figure 53. IT Investments: From Standardization to Digitalization**

Source: Company reports

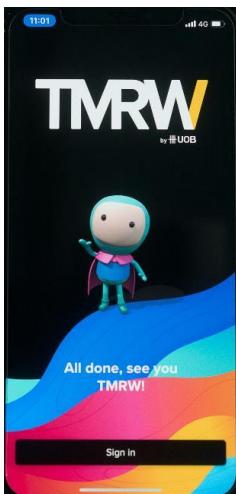
**Figure 54. UOB: Select SME Digital Initiatives**

	Comment
<b>The FinLab</b>	Started in 2015 and funded by UOB, The FinLab operates accelerator programs for growth of FinTechs, with the most recent cycle focusing on helping meet the needs of SMEs in Thailand with innovative technology solutions.
<b>BizSmart</b>	UOB's cloud-based integrated banking solution enabling small businesses to automate administrative processes such as sales, payroll and accounting.
<b>SME digital marketplace</b>	In October 2018 together with telco StarHub, UOB launched a digital marketplace for SMEs. This could help provide solutions such as point of sale systems, mobile ordering and in-store analytics
<b>EzyProcure</b>	In November 2018 UOB expanded its BizSmart solution to include a procurement platform called EzyProcure. The platform aims to help SMEs in the food & beverage sector keep track of purchases and prices electronically. Buyers can use UOB's virtual payment solution which provides them with interest-free credit, allowing them to extend their credit cycle up to 90 days.

Source: Company reports

## TMRW: UOB's Standalone Digital Challenger Bank for ASEAN

Figure 55. TMRW by UOB



Source: UOB

"TMRW" is the third prong of UOB's digital banking strategy. It is a digital-only bank, leveraging UOB's technology platform to go from inception to launch in only 14 months. TMRW will target the "mobile-first and mobile-only" young adult generation and despite an initial launch only in Thailand in early 2019, TMRW is expected to launch in other ASEAN markets by year-end 2019.

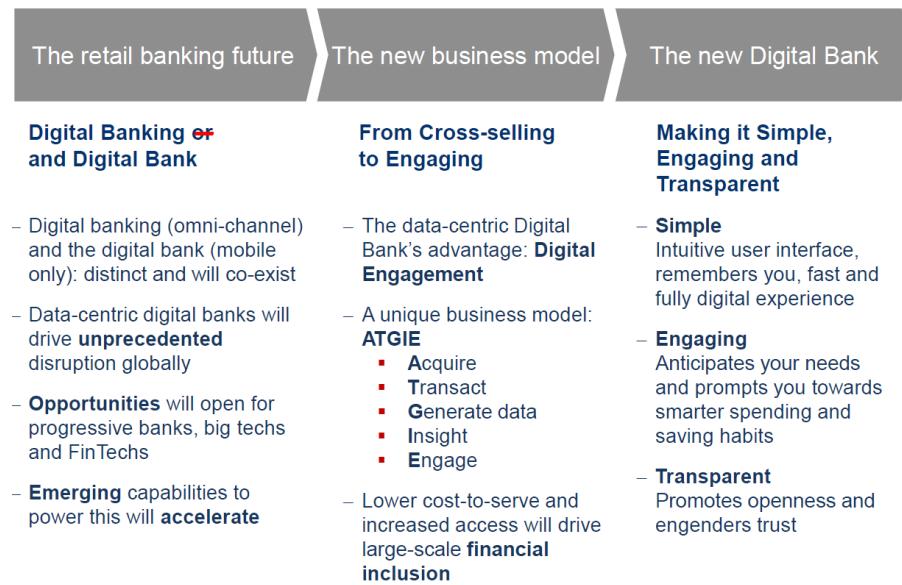
TMRW engages customers by leveraging transaction data to personalize services, for instance by bringing up appropriate functions and information specific to the user, instead of using a standard menu. TMRW aims to lower customer pain points with banking such as banking jargon, hidden fees, and provide engagement through chatbots/gamification.

TMRW will eventually move to offering small ticket loans to customers by leveraging data. TMRW is the first foreign party to launch a mobile bank in Thailand, although several Thai banks have launched or are also about to launch digital banks.

- **Why create a standalone digital bank?** The new standalone digital bank will serve a different customer segment under a different branding from UOB's in-bank mobile offering called "UOB Mighty", the latter being part of a omni-channel bank service to UOB's traditional customers.

The learnings gleaned from digital (such as machine learning, data, UI design and rapid feedback loops) will be used to enhance existing bank digital offerings as well as the new digital bank.

- UOB's proprietary business model focuses on engagement rather than traditional cross sell. Designed to comprehensively address the entire customer life cycle and deepen relationships, the business model comprises five stages:
  - **Acquire (A):** Customer onboarding has been redesigned to be fast/modular, able to quickly adapt to regulatory requirements and norms of different countries.
  - **Transact (T):** Enhance offering through better UI/features such as goal savings and control capabilities (like credit limit reduction).
  - **Generate Data (G):** Uncover customer needs so they see value in transacting frequently. Data will be extracted real time and used to increase relevance/context to product offerings.
  - **Insight (I):** Cognitive analytics engine will use machine learning to extract customer insights to engage in meaningful conversations with customers and meet their financial goals.
  - **Engage (E):** Engagement Lab is a cross functional unit which aims to design and rapidly learn best ways to engage customers. As customers engage more, transact more, they generate additional data and create a virtuous cycle, encouraging deeper engagement, long term loyalty and advocacy for the Digital Bank.

**Figure 56. UOB's View of Retail Banking's Digital Future**

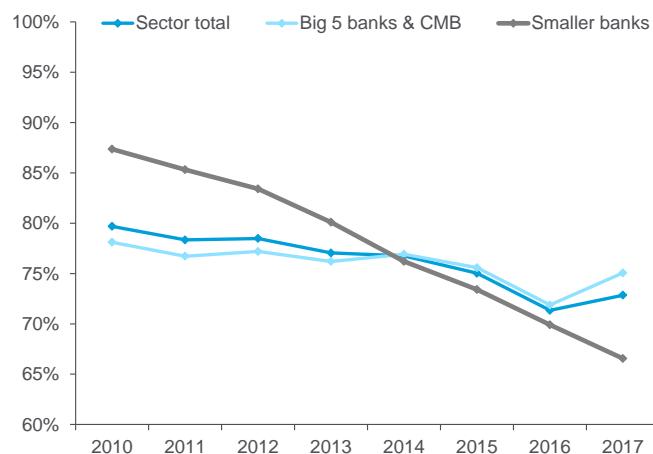
Source: UOB

## Incumbent-led Digital Banks in China

The growth of direct banks (digital banks) in China has been driven by traditional banks need to transform their business models in order to maintain profitability. Traditional Chinese banks have faced increased profitability pressures in the last few years owing to: (1) declining income contribution from non-differentiated traditional lending business due to interest rate liberalization and intensifying competition for deposits; and (2) falling lending market share given the rise in financial disintermediation trend and aggressive expansion of Internet finance companies.

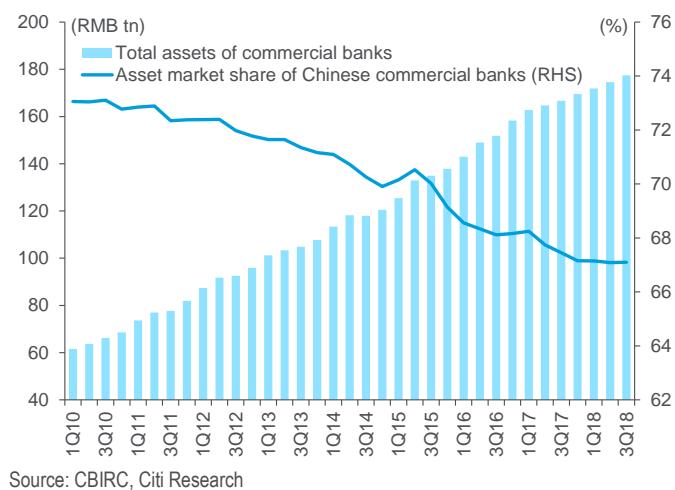
In 2013, Bank of Beijing launched the first-ever Chinese direct bank jointly with ING Bank. Since then, direct banks have mushroomed across China. As of end-2016, 113 direct banks have been set up and over 85% of them were founded by rural financial institutions/city commercial banks, which could likely be due to the higher vulnerability of their traditional banking business to FinTech disruption.

**Figure 57. Chinese Banks Saw Declining Income Contribution from Traditional Lending (net interest income as % total revenue)**



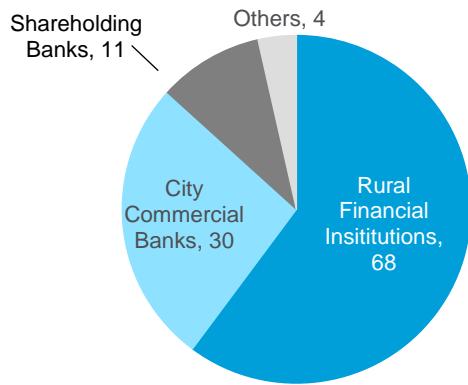
Source: Company data, Citi Research

**Figure 58. Chinese Banks Have Been Losing Lending Market Share Due to Rising Financial Disintermediation Trend in China**



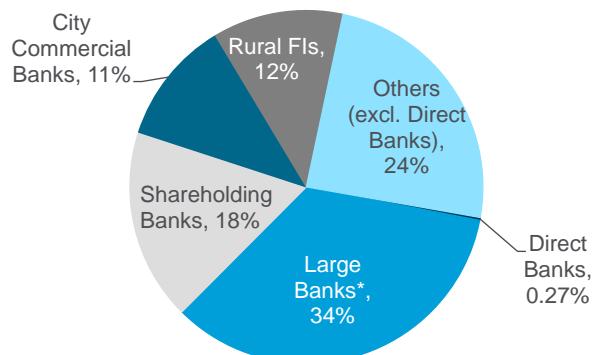
Source: CBIRC, Citi Research

**Figure 59. Number of Chinese Direct Banks by Ownership**



Source: iResearch, Citi Research

**Figure 60. Asset Market Share of Chinese Banks**



Note: Large Banks include Big 4 banks and Bocom  
Source: iResearch, Citi Research

Notably, growth in asset size of Chinese direct banks has been less exciting versus the United States. By 2016, Chinese direct banks accumulated total asset of RMB0.63 trillion (\$94bn), equivalent to merely 0.2% of China banking system's total assets, far below the 5.4% in the U.S. We believe some of the challenges facing the sector include:

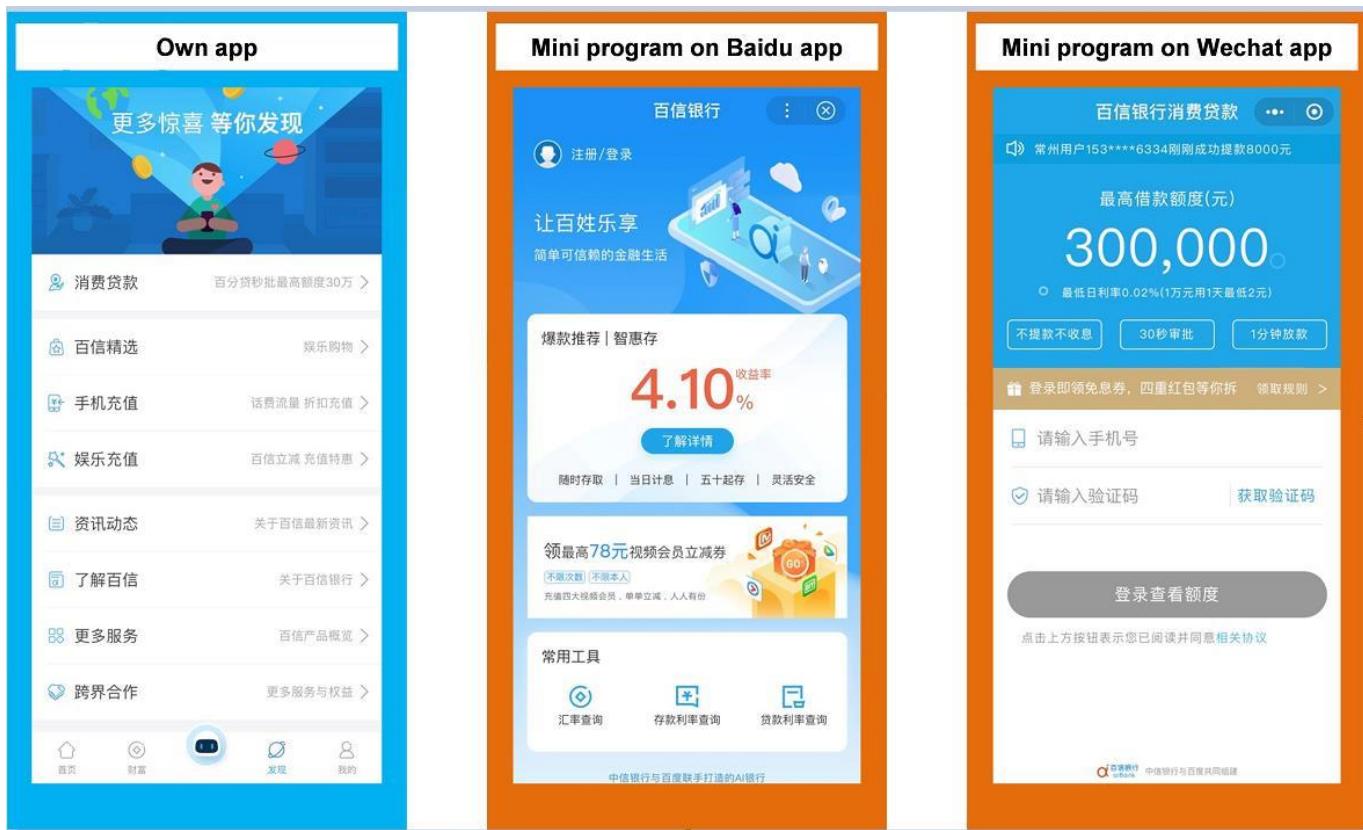
- **Lack of operational independency:** Most direct banks operate as subsidiaries of commercial banks and conduct their business through the bank's existing e-banking channels. Reliance on parent's approval and funding support has lowered their efficiency in technology advancement and talent acquisition, putting them at an unprivileged position in the competition against nimble and market-driven Internet finance companies;
- **Customers' preference for face-to-face account opening:** According to the South China Morning Post, a survey conducted in 2018 by a newspaper showed many Chinese still had reservations about remotely setting up a bank account, which has increased the difficulty of customer acquisition for direct banks in China;
- **Limited product portfolios:** Due to stringent regulatory requirements, the services/products provided by direct banks are largely restricted to deposits, money market funds, fund transfers, and payments.

Nevertheless, we see direct banking in China has entered a new development phase with the opening of aiBank, the first independently-operated Chinese direct bank established jointly by China CITIC Bank and Internet giant Baidu.

#### aiBank – JV of Financial Incumbent and Tech Giant

After two years of preparation, China CITIC Bank and search engine giant Baidu Inc officially launched their direct banking JV in November 2017, dubbed as aiBank, marking the commencement of China's first direct bank operating as an independent legal entity. In one year's time, aiBank has evolved into a comprehensive financial platform offering consumer/small business operating loans, wealth management products, and payment services. In addition to its own app, customers can access aiBank's products via its mini program on both the Baidu and WeChat apps.

Figure 61. aiBank: Customer Acquisition Channels



Source: Company reports

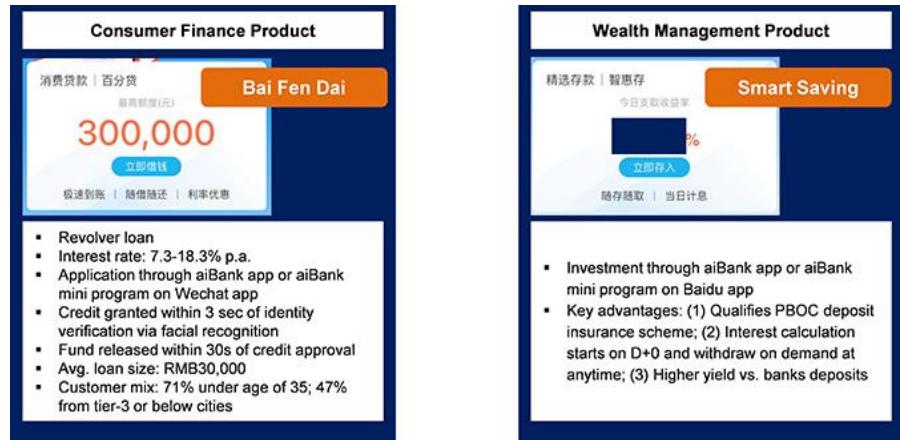
aiBank delivered strong results in its first year of operation. According to China Daily, aiBank's total assets reached RMB34.2 billion (\$5.1bn) and its total app users exceeded 10 million as of October 2018.

Management attributed their growth to the strengths inherited from its two parents, heavy technology investment, a professional team with strong technology background, and its platform strategy to diversify revenue streams:

- **Inheritance of parents' strengths** whereby aiBank could leverage CITIC Bank's financial expertise and well-developed offline channels, as well as Baidu's advanced technology and large online customer traffic, which allows its products/services to enjoy the stability of traditional finance provider and the speed of Internet companies;
- **Heavy technology investment** as evidenced by over 50% of its total investments allocated to tech development and IT professionals accounting for more than 70% of aiBank's total headcount. The company has obtained over 20 intellectual property rights and is applying for China's National High and New-Technology Enterprise qualification;
- **A team of young & energetic professionals** with strong technology backgrounds with post-90 generation accounting for over 30% of the company's total staff and a hiring plan focused on recruiting post-90s who possess comprehensive finance and IT skills. In addition, we note that five out of six top management executives come from technology industry;

■ **Platform strategy to diversify income streams** with their products categorized into three main segments, including: (1) traditional financial services including consumer/micro credit services, wealth management products, and payment services; (3) FinTech applications; (3) financial products built around daily consumption scenarios including e-commerce, entertainment and education.

Figure 62. Key Consumer Finance and Wealth Management Products for Retail Investors



Source: Citi Research

aiBank serves as a unique example globally of a tie-up between an incumbent bank and an Internet giant, with its business model well studied and followed by many virtual banks in Hong Kong. We summarize its key advantages as follows:

- **Versus direct bank purely owned by traditional banks:** (1) More effective in attracting and retaining talent given more horizontal corporate culture and better compensation; (2) greater innovative capacity given more market-driven business strategies supported by flatter organizational structure and simpler approval process; (3) stronger technology capability leveraging the IT infrastructure and data of the Internet giant partner; (4) large online customer base thanks to the customer traffic of the Internet parent.
- **Versus Internet finance company:** (1) Branding support from parent bank; (2) access to parent banks' corporate customers, broadening its customer acquisition channel; (3) stronger product development capability and deeper understanding of customer needs by building on the parent bank experiences.

## Incumbent-led Digital Banks in Taiwan

Taiwan is a fragmented market with 39 domestic banks and 29 foreign banks for a population of 24 million. Even the largest bank in Taiwan has deposit market share of just over 10% and the top four banks have deposit market share of around 30%. Incumbent banks with low market share in retail see digital banking as a way to acquire young and digitally savvy customers.

Taiwan's banking regulator started to allow banks to open accounts for new customers online in 2015. Currently, 23 Taiwan banks offer digital bank accounts that support a wide range of services including current account and savings account (CASA) deposits, foreign exchange (FX) deposits, term deposits, and payments.

As of June 2018, total number of digital accounts reached 917k, 4.5 times of the number from a year earlier. The three largest virtual account providers are Taishin's Richart, O-Bank, and Cathay's KOKO Bank. The three together, as of June 2018, have 85% market share by account number. Richart alone has 60% market share according to Taishin in 2017.

The Financial Supervisory Commission of Taiwan (FSC) plans to deepen its digital agenda by issuing two digital-only bank licenses in 2019, which could introduce non-bank led new digital banks to Taiwan. Some of the high-profile applicants include a consortium led by communications company LINE and some private Taiwan banks, a "national team" led by Chunghwa Telecom, and a partnership consisting of Rakuten and Waterland Financial. The incumbent banks are particularly concerned about LINE getting into banking.

LINE is the most popular social/messaging app in Taiwan with 17 million (70% of the total population) users in Taiwan and 400 million+ globally. LINE Pay is already a top player in mobile payment with market share of around 22.3% in 2019, according to Market Intelligence & Consulting Institute (MIC).

If LINE does manage to get a digital-only bank license, it could replicate the success story of Kakao in Korea in customer acquisition — 2 million+ clients in two weeks. Richart's current market leading position could be at risk.

### Richart – Incumbent Revolutionizing Customer Experience

Taishin launched Richart in 2016 and it soon became the clear market leader. They specifically target the younger generation (20-40 years old) by offering seamless digital experience, full-suite of products (from deposit, FX and expense management to investment) and attractive deposit rates (Richart's CASA rates of 0.45-1% are close to some banks' time deposit rates).

Richart has so far developed more than 20 financial products and services, four of which are exclusively patented, e.g. AnyPay, a money transfer system that helps users split and track expenses; a pre log-in service that allows customers to see some less sensitive banking info without going through full identity authentication; a cash rebate service that can directly credit into user's Richart account.

Figure 63. Richart's Intuitive Interface



Source: Richart

Figure 64. Users Can Easily Adjust Their Investment Portfolio on Richart Based on His/Her Needs and Risk Appetite



Source: Richart

Richart is one of the first in Taiwan to adopt biometric authentication and cardless ATM withdrawal. They are also developing a chatbot to provide 24-7 customer support.

To complement Richart's virtual account service, Taishin introduced GOGO credit cards to the market. Richart's customers can get 1% additional cash rebate (3.5% max cash rebate in total) from any GOGO card spending.

Richart partners externally as well with BNP Paribas and Tai An to provide a diverse mix of insurance and investment products that can be bought online conveniently and even in small amount, a feature that is well-loved by many customers.

Richart shows that traditional banks can also lead in FinTech with the right strategy in place. As of November 2018, over 60% of Richart's more than 450k users were first time customers of Taishin Bank, according to Oliver Shang, the President and CEO of Taishin.

Sector wide, virtual accounts only represent a small percentage of Taiwan banks' loan and deposit balances right now. Most of the banks tend to see virtual account as a client acquisition strategy rather than a stand-alone business.

Attractive rates offered means customer acquisition costs for these virtual accounts are high despite the efficiency benefits brought by technology, not to mention the development costs of those new digital services.

Over the longer term, traditional banks expect to monetize these investments by cross-selling higher margin banking products to the expanded client base as their needs become more sophisticated.

## Incumbent-led Digital Banks in Japan

In the U.K., which has adopted an advanced approach, the financial authorities have proactively pursued regulatory reform to enable new challenger banks to emerge. By comparison, Japanese moves in this area have been leisurely.

We can group the moves of Japanese banks into three areas. New banks in particular already have operations of a certain scale in the first two area and are being well supported by their customers.

■ **Retailers boost their financial businesses:** Aeon Financial Services, Seven Bank, Lawson Bank etc. (which plan to expand business lines moving forward).

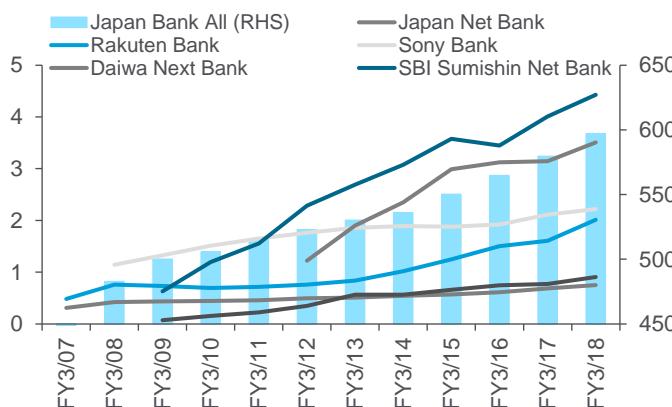
■ **Dedicated Internet banks (some have brick-and-mortar stores):** Rakuten Bank, SBI Sumishin Net Bank, etc.

■ **Traditional financial institutions' approach in payment operations:** SMFG's payment platform, MUFG's new payment strategy, Mizuho Financial Group's JCoin concept, regional financial institutions' QR code payment approach.

Dedicated Internet banks are steadily expanding their deposits and at the same time delivering relatively low overhead ratios (OHRs). That being said, we do not feel their impact amounts to a threat to established financial institutions once one looks at the overall Japanese bank industry.

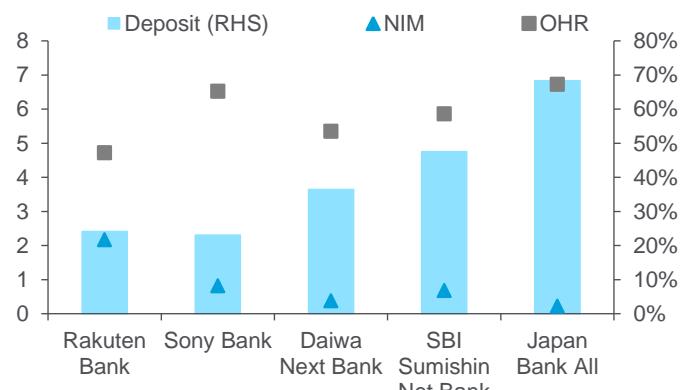
Nevertheless, fresh moves are gradually taking place in the fields of money transfers and payments. For more on payments, see our report, [Consumer payment services sector - Cashless payment market outlook—the calm before the storm.](#)

**Figure 65. Deposits Over the Long Run at New and Established Japanese Banks (¥ trn)**



Source: Company data, Japanese Bankers Association, Citi Research

**Figure 66. New and Traditional Banks: OHRs, NIMs and Deposits**



Note: "Japan bank all" is as of March 2018, others are as of September 2018

Source: Company data, Japanese Bankers Association, Citi Research

## Approach of Japan's Financial Regulatory Authorities

Japan's financial regulatory authorities are trying to promote the restructuring of Japan's financial service businesses. The government and administration are endeavoring to make the financial regulatory structure more function-specific and lateral, with the plan being to apply uniform rules to the same functions and the same risks.

They are currently advancing expedited digitalization and with the active use of data coming to have a major impact on the ideal shape financial services are seen as taking, discussions regarding the active use of data are centered on: (1) the active and appropriate use of data; (2) lateral payment legislation; (3) the response to platform providers; and (4) revisions to regulations governing banks and banking groups.

Debate has been advancing relatively rapidly concerning lateral payment legislation. Here a major government-led initiative aims to create legislation governing financial service brokerage that cuts laterally across finance industry operational categories. This involves:

- The promotion of the entry of new businesses and the revision of legislation to make it lateral and function-specific so that uniform rules can be applied to the same function and risk in cases where related legislation is currently organized by operational categories, so that individuals and businesses can engage in transactional services under more convenient conditions.
- With the aim being to realize a cashless (or payment-less) society in which people can receive goods and services without being aware of payments and settlements, to promote easier money transfers that are not routed via banks, to remove systemic impediments so that individuals can smoothly transfer money without the intervention of banks simply and with a single smartphone between each other. Specifically, the goal is to enable transfers of money over the web for less than the cost of the use of a bank ATM for individuals and SMEs through the revision of financial legislation, including the upper limit on transfers of ¥1 million (\$9k) in the Fund Transfer Law.

### Moves to Ease Payment Regulations Beginning to be Taken

According to media reports, the Financial Services Agency (FSA) has started looking at: (1) Deregulation to make it easier for institutions to handle fund transfers that are limited to one-time transactions of a few tens of thousands of yen; (2) revisions to the regulations governing the protection of deposited funds; and (3) the approval of the establishment of a new classification for the transfer of large sums in excess of ¥1 million, with these moves being aimed at businesses other than banks (Nikkei, March 5). We will be interested to see how businesses respond.

## Incumbent-led Banks in the UAE

### The New Age Banking Application “Liv.”

A key focus for Emirates NBD (ENBD) in the past few years has been the investment and approach towards using digital technologies to service customers. In fact, the bank announced in 2016 an investment of AED500 million (\$136m) in digital initiatives, to be spent over the next three years focusing on the front-end customer experience. As part of this investment, the bank launched Emirates NBD Future Lab in 2016 and the digital bank (liv.) for millennials.

Subsequently in 2017, ENBD further announced plans to spend AED1 billion (\$272m or ~20% of their 2017 cost base) over the next three years on digital technologies focused on improving back-end infrastructure of the bank and getting the right talent in place.

ENBD launched the first digital bank called Liv. in February 2017. The bank positioned Liv. as the bank for the millennials. Liv. aimed at providing a digital experience for a new generation of customers, providing a banking platform that is intuitive and simple to use. This foray into the digital-only banking space was part of the AED500 million technology spend that ENBD announced in 2016 and helps the bank build on its role as a leader in providing smart banking services in the UAE.

Key features offered by Liv. include:

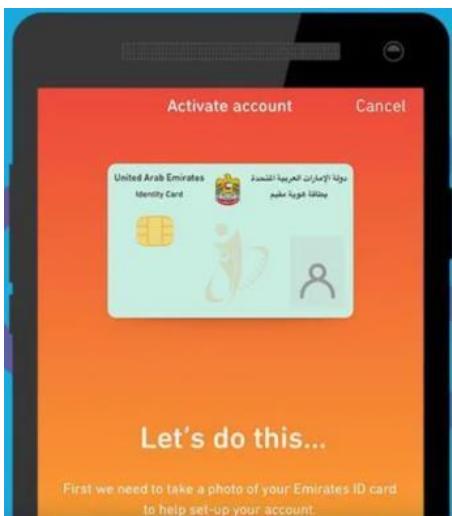
- Instant opening of a bank account using the Emirates ID card – through the application. Anyone (>18yrs of age) with a valid UAE Emirates ID and a UAE mobile number can open a Liv. account.
- Customers can then deposit funds into their accounts immediately using any bank debit card or via cash deposits in any ENBD cash deposit machine.
- Eligible customers can activate a new debit card from within the app and can use it for purchases globally.
- Pay bills, split bills and share money using social media.
- Rewards and deals on using Liv. for payments.

Figure 67. Liv. Account Opening Process



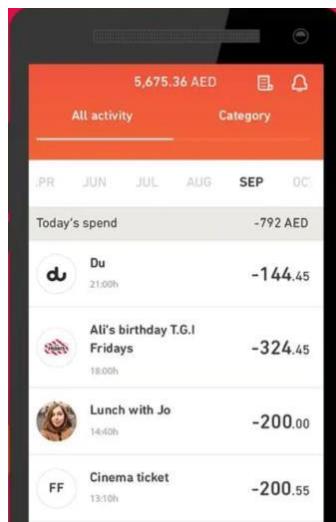
Source: Company website

Figure 68. Liv.: Activating the Bank Account



Source: Android PlayStore, Company App Pages

Figure 69. Liv.: Managing Finances



Source: Android PlayStore, Company App Pages

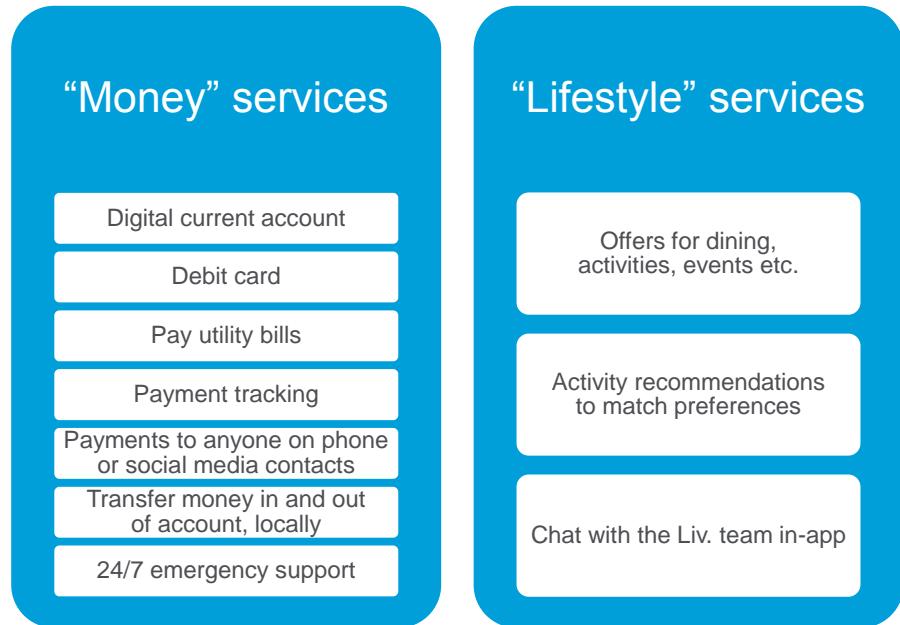
Figure 70. Liv.: Restaurant Offers



Source: Android PlayStore, Company App Pages

The Liv. app is designed to be mobile- and social-first with a strong emphasis on providing a fresh customer experience. The app offers a range of "money" services with real-time insights on transactional history and spending patterns, bill payments and transfers, budgeting finances effectively as well as "lifestyle" services such as a curated daily feed of latest happenings, selected deals, fitness trackers to manage health regimen etc. The new app also partners with popular lifestyle brands in the region such as Zomato, Fetchr, Voucherskout, and Careem.

Figure 71. Liv. App Functionalities



Source: Company website, Citi Research

# BigTech & Telco-Led Challenger Banks

Mobile money is the technology that allows people to receive, store, and spend money using a mobile phone device. Thanks to a combination of simplicity, convenience, and safety, mobile money uptake has grown at a rapid pace globally, and is fast becoming an alternative to bank accounts and payment services in several emerging and frontier markets.

At the center of the payments transformation are mobile wallets (also known as digital wallets or e-wallets) that can hold a previously defined payment instrument (e.g., credit card details) or a digital equivalent of currency, and can be used to transfer money between two parties.

In this chapter, we take a close look at how mobile money is evolving into a possible challenger to banks in several emerging markets — and attempt to identify some of the prominent emerging markets, where this trend is fast emerging. But before we go into those details, we re-visit the history of mobile money.

## Evolution of Mobile Money

The beginnings of mobile money can be traced to the Philippines with the launch of SMART Money & GCash in the early 2000s. However, both platforms registered only modest success and the Philippines remains a market with unfulfilled mobile money promise. It was not until the advent in 2007 of M-Pesa in Kenya that the full potential of mobile money came to the fore.

Initially, M-Pesa was developed by a small Vodafone team as a way to distribute micro-finance loans efficiently via mobile phones, but it quickly became apparent that there were many use cases beyond the original business model (“Money, Real Quick – The Story of M-PESA”, Tony Omwansa and Nicholas Sullivan, 2012). Within a year of launch there were two million users as consumers began using it for domestic remittances and businesses also began using it.

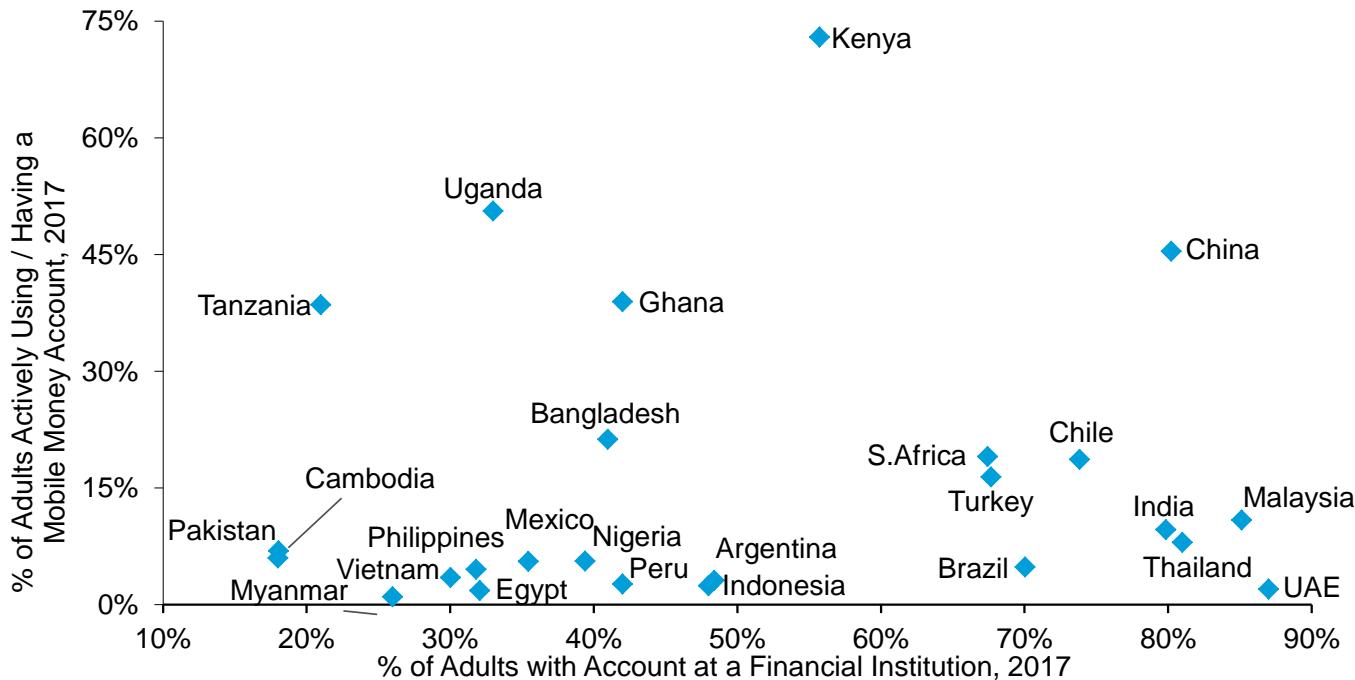
In 2010, Indonesia became the first market to enable customers from one mobile money provider to send money directly to the accounts of customers of another provider – thus making the service interoperable. The introduction of mobile loans by Safaricom in 2012 signaled the move deeper into products and services that were traditionally the preserve of banks. In 2013 Alipay upgraded its e-payments app to support physical locations and together with rival WeChat Pay has become the ubiquitous first choice for small payments in China.

Interestingly, the development of mobile money has taken different paths globally depending on local needs. While the Safaricom/M-Pesa model in Kenya grew as a result of the need to transfer funds by migrant laborers in an environment where bank account and formal payment penetration was low, the growth of mobile money in China traces its roots to the rapid adoption of e-commerce and social media platforms that required an online payment option that subsequently grew offline.

Today, Kenya stands out as the success story in mobile money penetration, with over 70% of adults having used mobile money in 2017, a figure larger than those who hold traditional bank accounts (only about 55% of adults). Other African countries, such as East African neighbors Tanzania and Uganda, and Ghana on the other side of the continent, also have nearly 40-50% of their population using mobile money. Outside Africa, only China comes close to such penetration levels.

The leader of the following pack of countries is Bangladesh with just over 20% of the population using mobile money, albeit for smaller size transactions compared to East Africa or China. Several large emerging markets, such as Pakistan, Vietnam, Philippines, and Mexico stand out for having only ~30% or lower formal banking penetration. So are these countries ready for a leap in mobile money usage similar to Bangladesh or even the East African pioneers and the Chinese behemoths?

Figure 72. Percent of People with Bank Accounts vs. Percent of People Using Mobile Money



Note: Mobile money adoption data for Russia and KSA not available, UAE data adjusted data and China and India data based on Citi Research estimates.  
Source: World Bank Survey, Citi Research

### EMs where Mobile Money can Play Challenger to Banks

Our Mobile Money Model (MMM) set out in Figure 73 below is an attempt to forecast future mobile money growth based on key variables that we believe will determine the speed of adoption. Markets with substantial upside for mobile money growth represents focus areas where these mobile money applications can play potential challenger to banks.

We look at factors such as cash usage, alternative payment methods, banking penetration, demographic change (internal migration, age), and the regulatory and institutional environment. The inputs we use are:

- **Cash Dependency:** Central Bank data (Monetary base-to-broad money ratio) and Visa and other sources on share of cash/checks in retail transactions;
- **Alternative Payment Options:** Percentage of adults who own a credit card, cross referenced with point-of-sale (POS) terminal penetration rates;
- **Unbanked population:** Percentage of people with bank accounts; and
- **Demographics (internal migration, youth population):** Change in urban population mix percent in 2020 vs. 2010 and % of population in 15-24 age group;

■ **Regulatory and institutional support for mobile money adoption:** World Bank regulatory quality index and Citi analyst views on local mobile money policy approach.

Figure 73. Mobile Money Model

	Cash Dependency	Absence of Alternative Payment Options	Unbanked Population	Demographics (Internal Migration, Youth Population)	Regulatory & Institutional Support	Mobile Money Future Potential
Argentina	High	Low	Medium	Medium	Medium	Medium
Bangladesh	High	High	High	High	Medium	High
Brazil	Medium	Low	Medium	Medium	Medium	Medium
Cambodia	High	High	High	High	High	High
Chile	Low	Medium	Low	Medium	High	Medium
China	Low	Low	Low	High	High	Low
Egypt	High	High	High	Medium	Low	Medium / High
Ghana	High	High	High	High	High	High
India	High	High	Medium	High	High	High
Indonesia	High	Medium	Medium	High	Medium	Medium
Kenya	Medium	High	Medium	High	High	Medium
Malaysia	Low	Low	Low	High	High	Low
Mexico	High	High	High	High	High	High
Myanmar	High	High	High	Medium	High	High
Nigeria	High	High	High	High	Low	Medium / High
Pakistan	High	High	High	Medium	High	High
Peru	Medium	Medium	High	Medium	High	Medium
Philippines	Medium	High	High	Medium	Medium	Medium
Poland	Medium	Medium	Low	Low	High	Medium
Russia	High	Low	Low	Low	Medium	Low
Saudi Arabia	Medium	Medium	Medium	High	Medium	Medium
S.Africa	Medium	High	Medium	High	Medium	Medium
Tanzania	High	High	High	High	Medium	High
Thailand	Low	High	Low	High	Medium	Medium
Turkey	Medium	Low	Medium	Medium	High	Medium
UAE	Medium	Low	Low	Medium	High	Medium
Uganda	High	High	High	High	Medium	High
Vietnam	Medium	High	High	High	Medium	Medium

Note that markets with at least four input factors as "High" are classified as "High MMM future growth potential"; Markets with at least three "Low" are classified as "Low" overall. Markets with three High and one Red are classified as "Medium/High"

Source: Citi Research

Based on our MMM analysis, we conclude that the markets that offer High future potential for the growth of mobile money are: Bangladesh, Cambodia, India, Myanmar and Pakistan (in Asia), Ghana, Tanzania, and Uganda (in Africa); Mexico (in LatAm). China and Kenya have obviously led the way to date in mobile money but there may be less relative upside here. Countries that should grow fast but face policy and other roadblocks: Egypt and Nigeria.

We classify markets like Kenya and China as having "Medium" to "Low" upside from mobile money growth in the MMM model explained above — partly driven by the fact that these markets have already seen substantial growth in mobile money adoption and usage. As highlighted earlier, the percent of population actively using mobile money accounts in these markets is already between 50-70%, and transactions to GDP are over 75% and 110%, respectively.

In the case of Ghana, Uganda, and Tanzania, although mobile money adoption is relatively high (40-50% of adults – similar to China), we rate these markets as “High” on mobile money growth potential as cash usage in these markets continues to remain high (unlike China) and there are limited competing payment sources available (e.g., cards). We also see the future growth in the mobile money business in these markets coming from expansion in the use cases for mobile money (e.g., higher merchant payments through mobile) in addition to higher P2P usage.

### Mobile Money Success Drivers

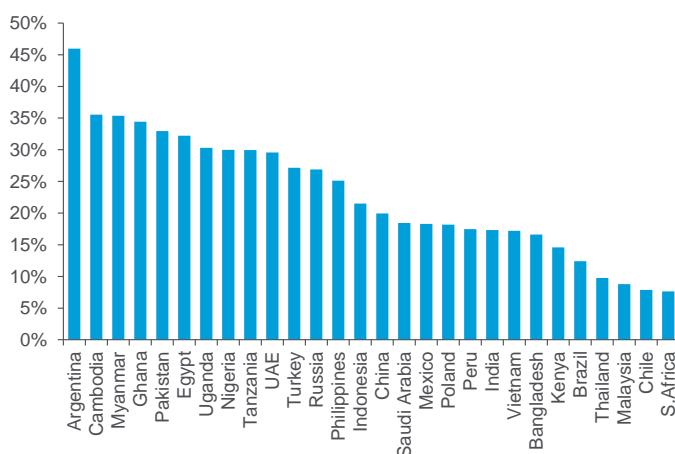
In the remainder of this section, we dive deeper into some of the variables of our Mobile Money Model that may determine the adoption and growth of mobile money.

**Cash Usage/Dependency:** We compare the monetary base/broad money ratios across markets, which ordinarily reflect the cash money multiplier in an economy (note that the monetary base is defined as currency in circulation plus commercial bank deposits held as central bank reserves – hence it may not be exactly the same as cash usage – albeit very close to that).

Based on this analysis, markets like South Africa, Chile, Malaysia, and even Kenya (when looking at the impact of mobile money usage) have low cash usage whereas markets like Cambodia, Myanmar, Ghana, Pakistan, or Egypt have high cash usage. A high monetary base may also reflect high central bank reserve requirements or the use of cash for ‘hoarding’ due to low trust in institutions or informal economic activity.

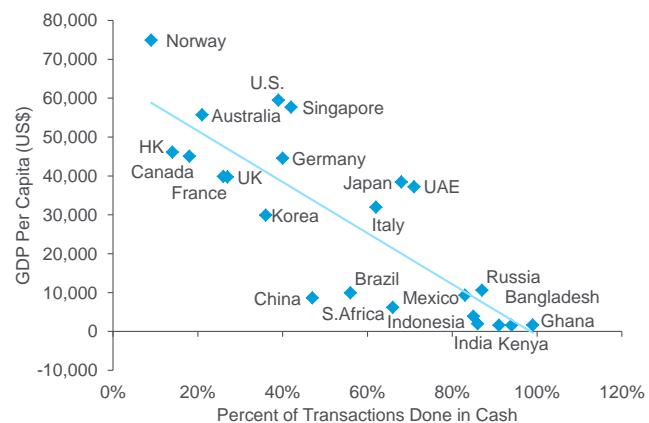
Among larger countries, based on the percentage of transactions done in cash (or check), the most cash-dependent include the likes of India, Indonesia, and Russia (see Figure 75). Relative to income level, China has a relatively low level of cash dependency, as does Brazil, and unlike Mexico. On the converse side, high income countries such as Japan, the UAE, and to an extent Italy are also more cash dependent than similar income countries such as the U.K., France, or South Korea.

Figure 74. Monetary Base as a Percent of Broad Money, 2017



Source: IMF

Figure 75. Percent of Transactions Done in Cash & Check vs GDP per Capita (%)



Source: Visa Investor Day Presentation, IMF, Better than Cash Alliance, Citi Research

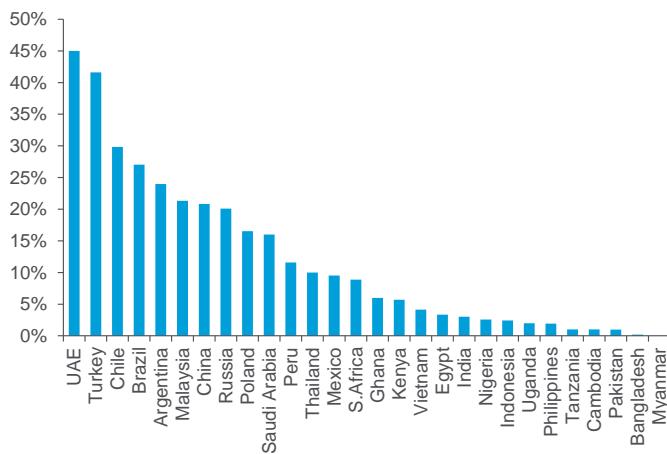
The Nordic region is one of the most cashless in the world, as we can testify from our personal experience over the past couple of decades of visiting the area. In our early days of covering Swedish banks in the late 1990s/early 2000s, there were still bank robberies in Sweden. Today, nearly all Swedish bank branches are cashless. Based on Bank for International Settlement (BIS) data, cash-to-GDP in Sweden dropped to 1.4% (2016) from 4.4% (2010) whereas in the U.S. it increased to 8% from 6% over the same period.

A country at the other end of the socio-economic spectrum, racing to cashless-ness is Somaliland. “With no internationally recognized banks, no formal banking system and ATMs an alien concept, Zaad — which was launched in 2009 (by mobile network operator Telesom) — and the newer e-Dahab have filled the void creating a mobile banking economy where money is stored on phones.” (BBC, Untold World, Sep 2017).

**Competing Payment Sources:** Necessity is the mother of invention. High usage and easy availability of alternative non-cash payment methods (e.g., debit and credit cards) could limit the potential for growth for mobile money as a payment channel. For example, markets like Bangladesh, Pakistan, and Tanzania, where credit card penetration is very low, provide fertile ground for mobile money to grow. In frontier markets, as best seen in East Africa, telcos have stepped into the banking void.

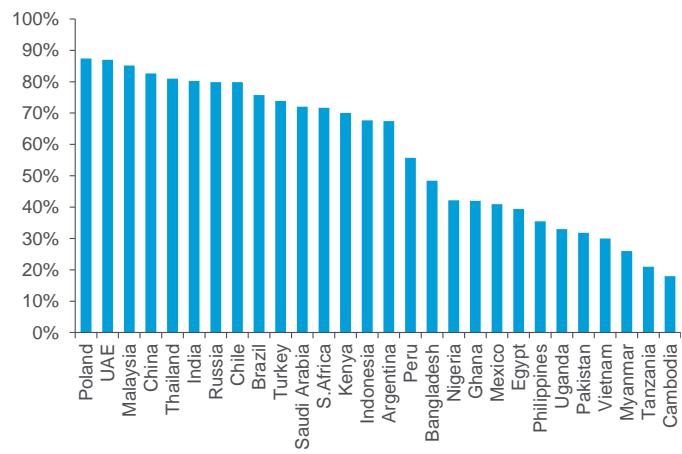
By contrast, in markets like the UAE or Turkey, the high usage of alternate payment methods such as credit cards has impacted the uptake of mobile wallets. The same challenge exists for lite mobile wallets (where you can only link cards but can't store virtual currencies), such as Apple Pay or Samsung Pay in wealthier economies in North America and Europe that have a high installed user base of credit and/or debit cards, many of which are now going contactless.

**Unbanked Population Opportunity:** Markets that have low banking penetration (e.g., Pakistan, Kenya, and the Philippines) offer fertile ground to capture new customers, often by targeting the bottom of the pyramid and improving financial inclusion. On that note the relative failure of mobile money to take off in South African (vs. Sub-Saharan African peers) is partially attributed to the market's higher bank account penetration and more developed banking and payments infrastructure.

**Figure 76. Credit Card Ownership (Age 15+, 2017)**

Note: On the MMM, markets with credit card ownership >20% are classified as having "Low" absence of alternate payment channels, while markets with <10% credit card ownership the factor is "High"

Source: World Bank Global Findex 2017, Citi Research

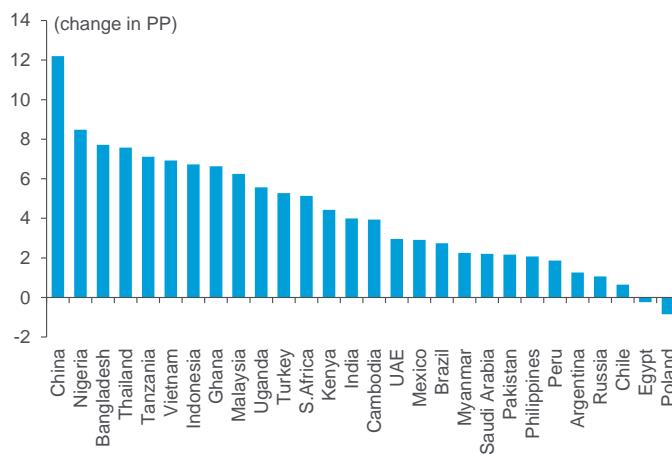
**Figure 77. Banked Adult Population (% of Adults with an Account at a Financial Institution), 2017**

Note: Markets with >70% banked population are usually marked as "Low" unbanked; while markets <45% population with bank accounts are marked as "High" on unbanked population on the MMM

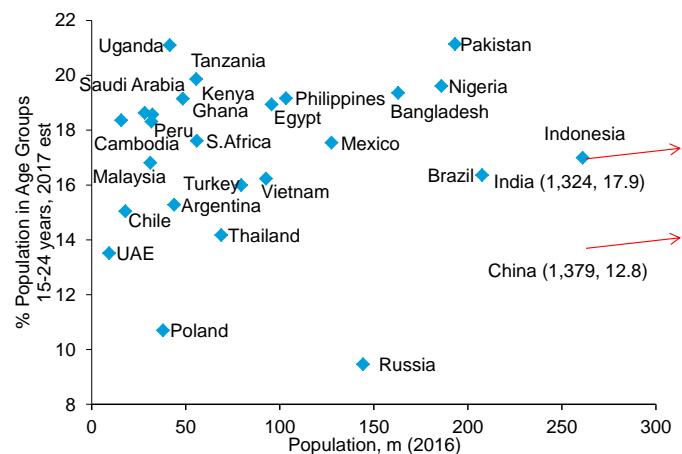
Source: World Bank Global Findex 2017, Citi Research

**Demographics:** Large rural-urban migrations have helped in the development of mobile remittance service. Markets like Kenya and Tanzania have seen significant movements in domestic labor, which has resulted in split families. This creates some need to financially connect families with the breadwinner.

A younger population is more likely to adopt digital product offerings versus an older population, where we could see some resistance to changes in the status-quo. Most emerging and frontier markets fare pretty well on this metric with a large proportion of their population relatively young.

**Figure 78. Change in % of Urban Population 2020E vs. 2010 (% pt)**

Source: United Nations

**Figure 79. Population Size vs. Young Population**

Markets with 9-13% of population in ages 15-24yrs are classified as "Low" on the MMM, while markets > 17% of population in that age brackets are classified as "High" on MMM

Source: World Bank, CIA World Factbook

**Regulatory Support:** The factors mentioned in this section count for little without a regulatory environment that promotes mobile money usage. The slew of disruptive innovations in finance (including mobile money) in recent years has kept regulators busy developing new legal frameworks and walking a fine line between too little and too much regulation.

Amongst the specific issues regulators face when dealing with mobile money are:

1. Level of flexibility in awarding mobile money licenses across industries (telcos & e-commerce vs. financial institutions);
2. Account opening/transaction KYC requirements;
3. Scope of services that agents are authorized to perform;
4. Treatment of new products; and
5. Regulation of fees and enforcement of interoperability.

Importance of regulatory support can best be seen in contrast between initial hands-off approach of Kenyan regulators, which has been widely credited with success of M-Pesa, and more restrictive treatment in Nigeria where uptake has lagged.

**Institutional Support:** We see access to capital and expertise from stronger players in more mature markets as another factor that could drive growth in mobile money in relatively “emerging” mobile money markets. For example, much of the early success of mobile money in countries like Myanmar and Pakistan was spearheaded by Telenor of Norway’s entry into those markets.

The ASEAN Telcos in their earlier days had arguably treated mobile payments as a peripheral activity rather than a viable revenue stream, but this is now also changing as demonstrated by their partnerships with global payment heavyweights such as Ant Financial. In Africa both Safaricom and parent group Vodafone have been expanding into new markets following their success in Kenya.

While not all these investments will directly lead to higher usage of mobile money, they do provide incentives and expertise to the local players to innovate and further push the theme.

**Figure 80. Selected Mobile Money Investments and Tie-Ups Globally**

Country	Commentary
Bangladesh	In 2018, Ant Financial Services Group announced it would take a 20% stake in bKash as part of a strategic investment at an undisclosed valuation. The financial backing provided by a recent Ant Financial investment is expected to help fund growth in these new product segments and to further cement bKash's market share lead.
Cambodia	In 2017, Alipay signed a partnership agreement with Cambodia's local mobile wallet Pi Pay, which would enable Alipay users to scan Pi Pay's QR codes for payment. With Ascent Money, Alipay has additional exposure to Cambodia. Local mobile wallet Wing has partnered with both Alipay and WeChat Pay to provide merchant acceptance through WingPay.
India	In 2015, China's Alibaba Group and affiliate Ant Financial have become the largest shareholders of One97 Communications, the parent of Indian e-tailer Paytm, by investing \$680 million. Alibaba thus becomes the biggest investor in Paytm in a deal which (at that time) valued the Indian online payments and ecommerce firm at about \$3.4 billion. More recently Berkshire Hathaway announced it is looking to buy a \$300 million to \$350 million stake in Paytm too.
Indonesia	In 2017, Ant Financial announced a partnership with Emtek to launch a payments platform called DANA on BlackBerry Messenger, which has 63m monthly active users in Indonesia. In 2017, Ant Financial acquired HelloPay, the payment wallet attached to Lazada that saw HelloPay rebranded locally as Alipay Singapore, Alipay Malaysia, Alipay Indonesia and Alipay Philippines in those respective markets. In 2013, Tencent and Indonesian company MNC Media had announced a JV that would launch various products and services to the Indonesian market. The same year, Tencent also entered into a partnership with PT Global Mediacom to boost WeChat's localization and adoption efforts in the country.
Kenya/Africa	M-Pesa is a mobile phone based money transfer, financing and micro financing service, launched in 2007 in Kenya by Vodafone for Safaricom and Vodacom. Since its launch, M-Pesa has amassed over 20.5m active users in Kenya, accounting for c78% of all mobile money accounts in the country and 80% of all P2P transactions in terms of value in 2017. Vodacom has also launched the service in Tanzania (>8m users & 200k agents) and in South Africa in partnership with Nedbank.
Malaysia	In 2017, Maybank, CIMB, Public Bank set up merchant acquiring partnerships with Alipay. Then, MOL also set up a merchant acquiring relationship with Alipay together with 7-Eleven Malaysia Holdings Bhd therefore extending Alipay acceptance to its 2,100 7-Eleven stores. In 2018, Hong Leong Bank became a merchant acquirer for WeChat Pay which was the first in Malaysia. In June, WeChat Pay launched a Ringgit-denominated WeChat Pay wallet for Malaysia, citing a large domestic user base of 20 million.
Myanmar	In 2016, Wave Money (a JV between Telenor & local bank Yoma), became the first non-bank institution to provide mobile financial services in Myanmar and the second mobile money player in the market. Today Wave Money has over 20,000 agents and over 1m customers.
Pakistan	Pakistan's first mobile money service Easypaisa was launched in 2009 as a partnership between communications company Telenor Pakistan (a subsidiary of Telenor Norway) and Tameer Microfinance Bank (in which Telenor acquired a 51% stake rising to 100% in 2016 when it was renamed Telenor Bank). In 2018, Ant Financial acquired a 45% stake in Telenor Microfinance Bank (Telenor MFB) for \$185 million, marking its entry into Pakistan (cited by FT, 13 Mar. 2018). Telenor MFB is Pakistan's leading mobile financial services platform with a market share of 45% (based on no. of active accounts), offering products such as loans, deposits, micro insurance, and mobile payments. The latest collaboration is expected to bring Ant's technological know-how from China to improve m-payments and financial services to individuals/SMEs in Pakistan.
Philippines	In 2017, Ant Financial took a 45% stake in Mynt, which operates GCash. In 2018, Ant Financial also established an agreement with the Rebisco Group's banking arm, Asia United Bank (AUB), which would allow it to perform Alipay acceptance for its merchants. In 2017, AUB had also rolled out acceptance for WeChat Pay.
Thailand	In 2016, Ant Financial bought a 20% stake in Ascend Money with an option to buy a further 10%, as reported by CNBC. In 2017, Alipay and Kasikorn Bank collaborated to enable Chinese tourists to scan KBank's existing QR code scheme to complete an Alipay payment. Kasikorn Bank had also made similar arrangements with WeChat Pay in 2016. In 2016, Asset Bright Company also announced a partnership to provide merchant acquiring services for WeChat Pay.
Vietnam	In 2017, the National Payment Corporation of Vietnam (NAPAS) signed a memorandum of understanding outlining the strategic partnership between the parties that would enable the acceptance of Alipay for Chinese travelling in Vietnam, and potentially enable Vietnamese NAPAS cards the ability to complete payments on Alibaba Group e-commerce sites. Tencent had collaborated with VIMO, a local e-wallet provider, to allow merchants to accept WeChat payments through the VIMO merchant app.

Source: Company reports, Tech in Asia, Reuters, ABS-CBN News, Khmer Times, Myanmar Business Today, Citi Research

## Mobile Money: From P2P to Financial Services

The core of mobile money remains transfer and disbursal of funds (P2P, merchants or government) but it has grown significantly to offer wide variety of products and services.

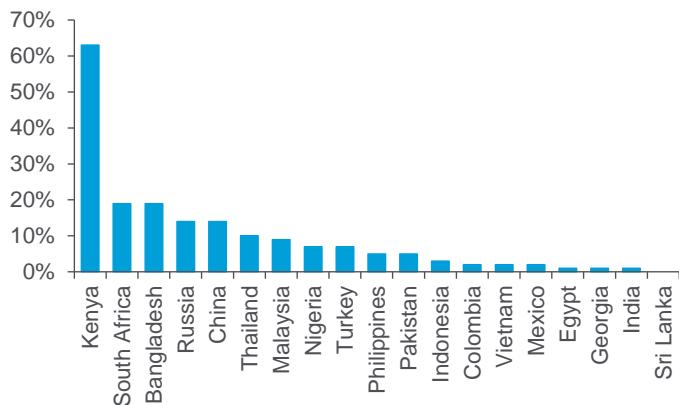
### Domestic P2P Transfers: Heart of Mobile Money Use Case

Domestic P2P transfers have been the main driver of mobile money growth in many markets, initially catering to unbanked migrant workers in the cities who needed to send domestic remittances back to their rural families, but now encompassing large swathes of the populations in many African and Asian countries.

Kenya leads emerging and frontier markets today in the share of the population that has sent domestic remittances through mobile phones in 2017 at just over 60%, followed by South Africa and Bangladesh at around 20% each. Kenya also leads in the share of domestic remittances that were conducted through mobile phones by participants at over 90%, followed by Bangladesh over 60%, and China at over 50%.

While the Kenyan P2P market looks saturated (over \$21 billion in total mobile P2P transactions in 2017 or 30% of GDP), markets like India, Egypt, or Vietnam (with a low percent of population engaged in mobile phone domestic remittances and low percent of total domestic remittances through mobile phones) have upside, both at the expense of traditional P2P domestic remittance channels and by expanding the user pool through the convenience of mobile services.

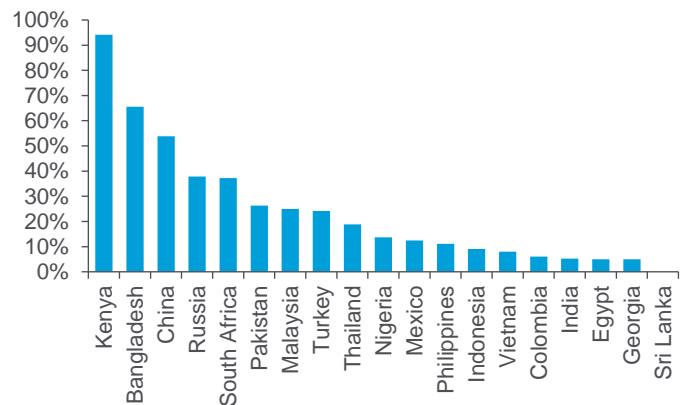
**Figure 81. Percent of 15yrs+ Engaged in Mobile Phone Domestic Remittances, 2017**



Note: Domestic Remittances are defined as from a relative or friend living in a different area of their country.

Source: Global Findex Report 2017

**Figure 82. Domestic Remittances Through Mobile as % of Senders & Recipients, 2017**



Note: Domestic Remittances are defined as from a relative or friend living in a different area of their country.

Source: Global Findex Report 2017

Part of the reason India meanwhile lags on domestic remittances via mobile is the currently limited mobile money agent networks. This means remittances are still highly dependent on traditional means of transfers (cash via informal networks or through bank/exchange branches or money orders) rather than mobile money platforms. We do however note the advent of payment banks in India (which includes mobile money firms like Paytm) who is currently in the process of setting up physical distribution points – that would work very similarly to the agent network elsewhere. For example, the Paytm Payment bank agents (which are usually local convenience stores or small shops) are responsible for opening new accounts, taking deposits and making account withdrawals on behalf of customers.

## The Role of Mobile Money Agents in Domestic P2P Transfer

This rise of mobile money remittances in many markets has been aided by the growth in the number of mobile money agents, which permit customers in cash-centric economies to deposit and withdraw funds conveniently from their mobile wallets without the need to travel distances. Accessibility to mobile money agents creates a compelling reason for the wider population to take up the service instead of relying on banks' smaller and expensive branch-based model.

In Kenya's case, average distance to bank branches was nearly 16-17km for the unbanked population and 7-8km for those with formal banking channels. Telcos' mobile money options gave the population a viable and more accessible substitute for formal banking channels with nearly 46,000 dealers/agents able to receive and distribute money as compared to just 1,000 bank branches in Kenya in the early days.

The agents also act to register/educate new customers and in many instances transact on their behalf (over-the-counter (OTC) transactions), no small matter in countries where illiteracy levels remain high and trust plays an important role, as in parts of South Asia and Africa. In Pakistan where data is available, OTC transactions accounted for 29% of mobile money transactions in 2017 (down from 88% in 2014 as mobile wallet penetration grew).

Agent networks can vary from independent operators working on a commission basis as is the case in most frontier markets or fulltime employees. The most common model is one using master agents, which are usually regional distribution companies distributing Telco airtime, fast-moving goods, or groceries to a larger number of sub-agents. The master agents act to collect excess cash float from the sub-agents and deposit it at banks and to distribute cash when needed. Telco-owned mobile money operators have generally been at an advantage over financial institutions when rolling out their services given their existing networks of prepaid mobile top-up card agents.

Figure 83. Safaricom/M-Pesa Agent in Kenya



Source: Fiona Graham / World Remit

Figure 84. HBL-Konnect Agent in Pakistan



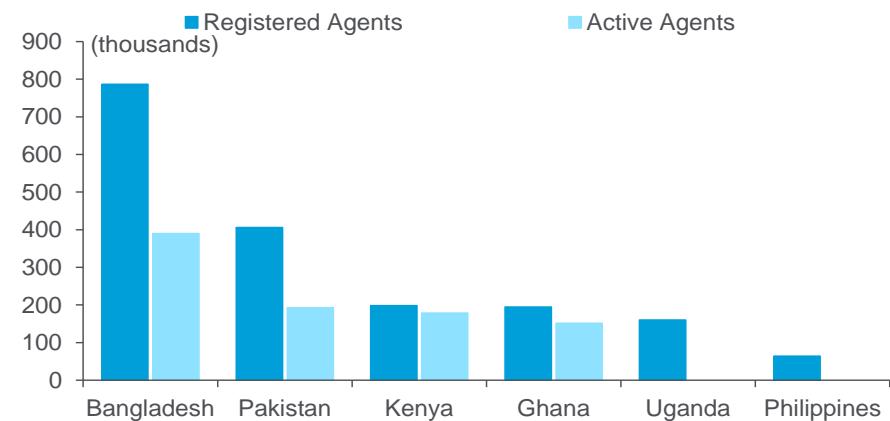
Source: Citi Research

Figure 85. Non-Exclusive Agent in Bangladesh



Source: Citi Research

In our sample of larger markets where recent data was available, Bangladesh is in the lead globally in 2017 with 790k registered mobile money agents (and 390k active agents), Pakistan ranks second at 400k agents (190k active agents), followed by Kenya, Ghana, and Uganda at just under 200k (with 180k & 150k active agents respectively), and the Philippines last at 64k.

**Figure 86. Mobile Money Agents, 2017**

Note: Active agents generally mean at least one transaction over a time period (usually 30 to 90 days). Note: Agents are double counted if they cater to more than one operator and exclusivity varies widely across markets - is generally believed to be more prevalent in Kenya than Asian markets.

Source: Citi Research, Central Banks Data, Telco Authorities.

### **Virtual Red Envelopes Support P2P Transfers in China**

Meanwhile in China, the rapid growth of mobile P2P transfers is best illustrated by the increasing use of virtual red envelopes by individuals during the Lunar New Year celebrations (red envelopes represent the Chinese tradition of gifting money during holidays and special occasions). Virtual red envelopes offer users the ability to give monetary gifts in the form of virtual credits to other users, with the money being deposited into a user's WeChat Pay account, which can be used for purchases. WeChat, launched in 2011, has firmly positioned itself as the digital leader in virtual red envelopes via its mobile payments platform (WeChat Pay). During the 2019 Lunar New Year holidays, 823 million WeChat users sent and received red packets (vs. 688 million in 2018). Other prominent Chinese companies including Alibaba and Baidu also allow users to send virtual red packets.

What is interesting, and possibly an evolving challenger to existing banks in emerging market, is the fact that use cases of mobile money now extends much beyond the traditional use case of domestic P2P transfers — moving into international remittances, mobile based lending, merchant payments — to name a few.

### **Mobile Money Intrudes into Broader Banking Services**

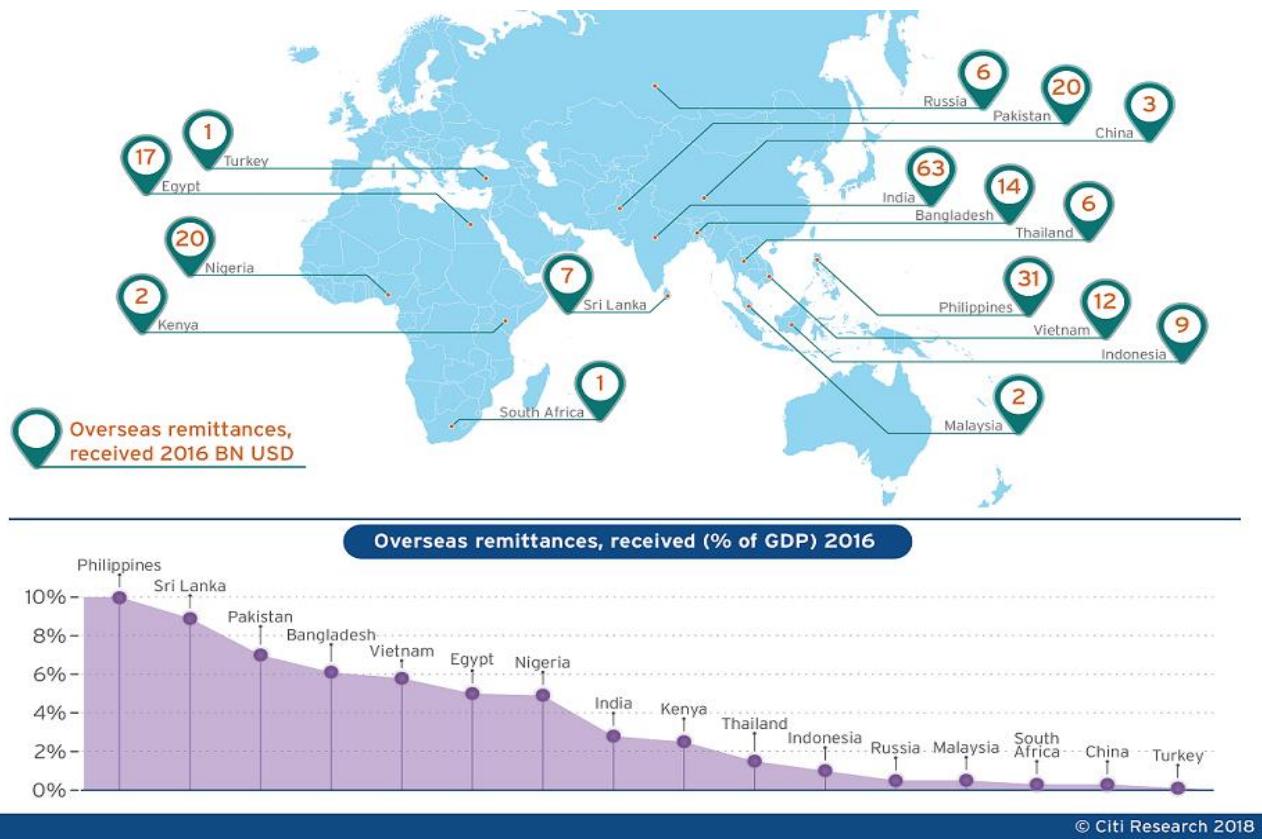
There were a host of banking services which earlier were limited such that only banks could provide them. Thanks to the regulators who allowed FinTechs and mobile money platforms to venture out and provide variety of other banking services and not just an interface to transfer and send across funds.

#### **1. International Remittances**

According to the World Bank, remittances to developing countries in 2017 are expected to touch \$550 billion, or 0.7% of global GDP. While the formal banking channels continue to represent a large part of the remittance chain, there are several other formal (e.g., currency exchanges) and informal channels (Hawala) that work in tandem in most economies.

Today, the top frontier and emerging market countries in our sample in terms of inflows of international personal remittances are India, Philippines, Nigeria, Pakistan, Mexico, and Bangladesh. When measured over GDP, the Philippines leads with inflows of over 10% of GDP, followed by Sri Lanka, Pakistan, Bangladesh, Vietnam, and Egypt.

Figure 87. International Remittance Inflows



Source: World Bank Data, Citi Research

Mobile money providers have rolled out services in many markets, hoping to build upon their lead in local P2P transfers to capture a share of the international remittances business. Market shares remain mostly small though, and unlike P2P transfers or payments, in remittances they are facing a well-established industry (e.g., banks) with an expansive infrastructure in place. Banks with international branches or money exchanges with established relationships with overseas exchanges are hence at an advantage, and furthermore regulatory daily and monthly limits on withdrawals from mobile money accounts can prove problematic for larger transfers. Consumer behavior is also a drawback, as remittances tend to be immediately converted to cash upon arrival leaving little cash float to earn interest on, an issue in markets like Pakistan where cash withdrawals from agents are subsidized and mobile money merchant payments are still nascent.

The Kenyan market has seen the most success, with Safaricom capturing a 14% market share by value of remittances into Kenya (for a 1% contribution to total company revenues). In the Philippines, the two main mobile money players PLDT and Globe have introduced products to facilitate receiving foreign remittances. Over in Bangladesh, bKash has been trialing a new system to lower costs after having struggled to capture market share through its earlier tie-up with Western Union, while main competitor DBBL has been incentivizing inward transfers through a 1% cash bonus. In Pakistan, the authorities working with mobile money providers have introduced a new class of Wallets dubbed the Home Remittance Account (HRA) focused on remittances, with offers of free telco airtime to users who receive funds from abroad.

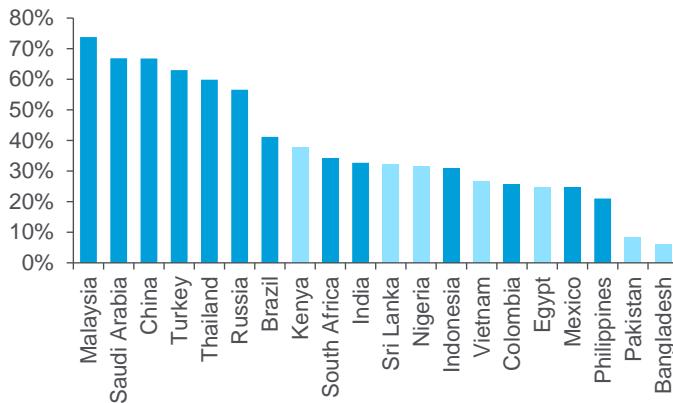
## 2. Merchant Payments

Among the most promising growth opportunities for mobile money providers in frontier and emerging markets are merchant payments, benefiting from the low penetration of traditional developed market payment infrastructure to rapidly ramp up their presence in the space and leapfrog customers straight into digital payments.

### Opportunity in the Underpenetrated Payments Space

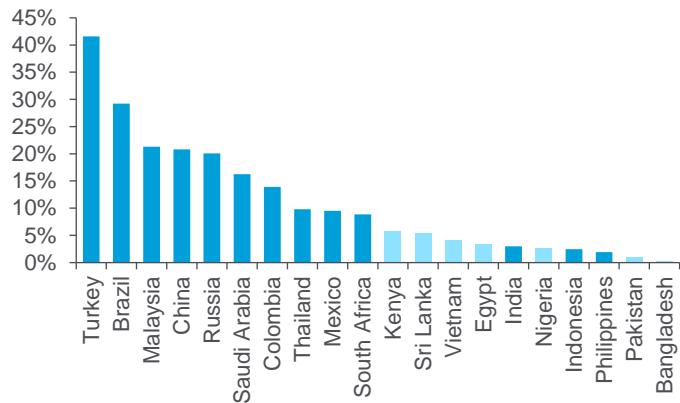
Frontier markets generally lag more developed emerging markets in debit and credit card penetration, due to lower levels of financial inclusion, larger share of informal economy, and underdeveloped retail lending practices. Bangladesh and Pakistan stand out as a distant last in our sample of the largest emerging markets and key frontier markets in card ownership, according to the World Bank 2017 Findex report. Meanwhile emerging markets like the Philippines, Indonesia, and India lag in credit card uptake, with Turkey well in the lead with 40% of the adult population owning one.

**Figure 88. percent of Adult Population Owning a Debit Card, 2017**



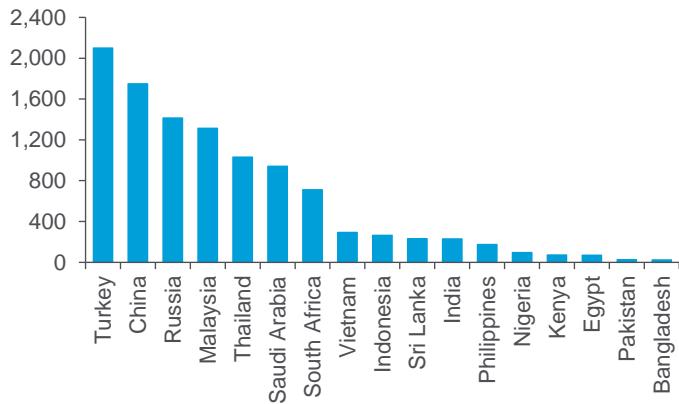
Source: World Bank Findex Data, Citi Research

**Figure 89. Percent of Adult Population Owning a Credit Card, 2017**

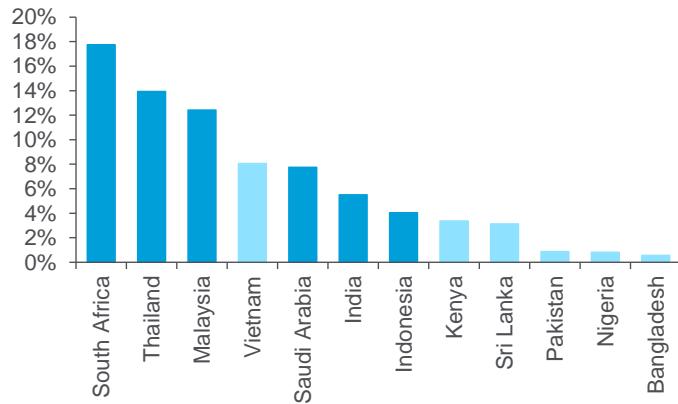


Source: World Bank Findex Data, Citi Research

This trend is repeated when we look at the infrastructure for processing card payments (POS terminal retailers penetration), and combined with the above is reflected in the overall low transacted value of card merchant payments/GDP for most frontier markets. Vietnam appears as the outlier thanks to the highest POS terminal penetration amongst the frontier markets and an above-average credit card uptake, while Bangladesh and Pakistan remain at the bottom of the rankings alongside Nigeria. Of the emerging markets, the Philippines, Indonesia, and India have the lowest penetration, while Turkey and China are again in the lead followed by Russia.

**Figure 90. POS Terminals per 100,000, 2017**

Source: Central Banks, Citi Research

**Figure 91. POS Transactions by Value/GDP, 2017**

Source: Central Banks, Citi Research

### 3. E-Commerce

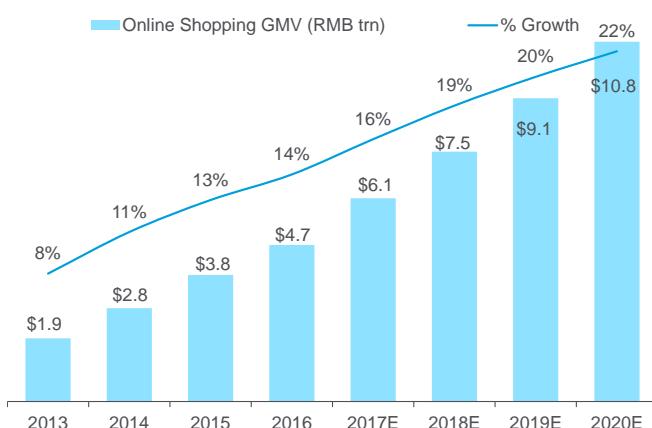
e-commerce is an important driver of mobile money growth, particularly across richer emerging markets. China is the poster-boy for e-commerce, but rapid growth is also seen in other emerging markets like ASEAN, SE Asia, LatAm, and Africa, fueled by rising smartphone/Internet penetration and an emerging consumer base with growing disposable income.

We believe e-commerce presents a compelling use-case for mobile money wallets, offering a simple and efficient online purchase experience. The benefits of Mobile Money in e-commerce are multi-fold: (1) wider choice of online payments and reducing dependence on cash on delivery; (2) lower merchant overheads costs; (3) allows for end-to-end automation of tracking customer purchasing and spending patterns; (4) pushes repeat purchases as offers and discounts given on the e-commerce part of the business sit as “cashbacks” in the mobile wallet instead of a direct discount if the transaction was done through a credit or debit card; (5) adds to the mobile money wallet business cash float.

Today China is the leading emerging market in mobile money e-commerce adoption with >60% transactions paid for through mobile wallets according to Worldpay's 2017 Global Payments Report, followed by India in a distant second place at 25%, with Malaysia well behind at <10%. For some of the markets like India, cash on delivery remains the leading choice for customers (although this is changing), while for others like Malaysia, high card penetration means traditional online card payments take a more prominent role.

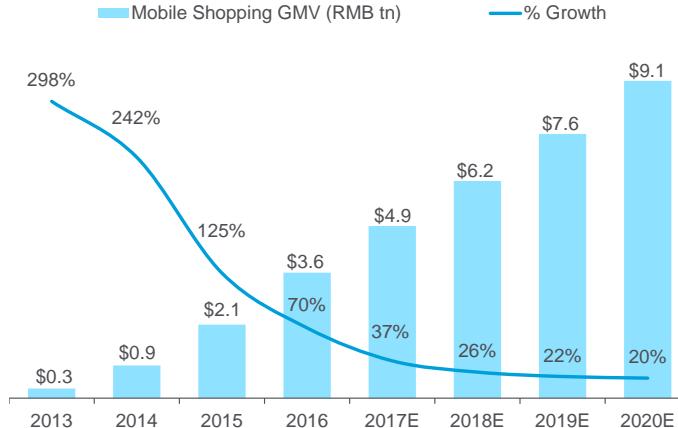
#### Case Study: China's Strong e-Commerce Growth Supports Mobile Money

China's leading payment and financial services company Ant Financial's journey into finance began with Alipay in 2004, as it attempted to solve the trust problems faced by buyers and sellers on Taobao/Tmall (Alibaba's e-commerce platform). To build trust, Alipay acted as a third party, temporarily holding money paid by buyers, only releasing it once buyers confirmed products were received in good condition. Gradually Alipay caught onto the rising momentum of m-commerce, becoming a dominant payment provider in China.

**Figure 92. China – Online Shopping GMV**

Note: inline shopping GMV refers to the sum of GMV of online direct sales business (B2C) and online marketplaces (C2C).

Source: iResearch

**Figure 93. China – Mobile Shopping GMV**

Source: iResearch

Today, China leads the world in e-commerce with possibly the highest transaction volumes of any country, followed by the U.S. In 2017, gross merchandise value (GMV) of China's online shopping amounted to RMB6.1 trillion (\$910bn), +30% YoY, of this mobile shopping was RMB4.9trn (\$731bn), +37% YoY.

### Case Study: India's m-Wallet (Paytm) Ramps up e-Commerce Platform

The mobile wallet market leader Paytm sees significant upside by expanding its wallet use cases to this fast-growing segment. Paytm's model in India shares many similarities with the Chinese model. Paytm initially started off in 2010 by offering mobile recharges and utility bill payments, but soon added functionality for money transfers and more payments.

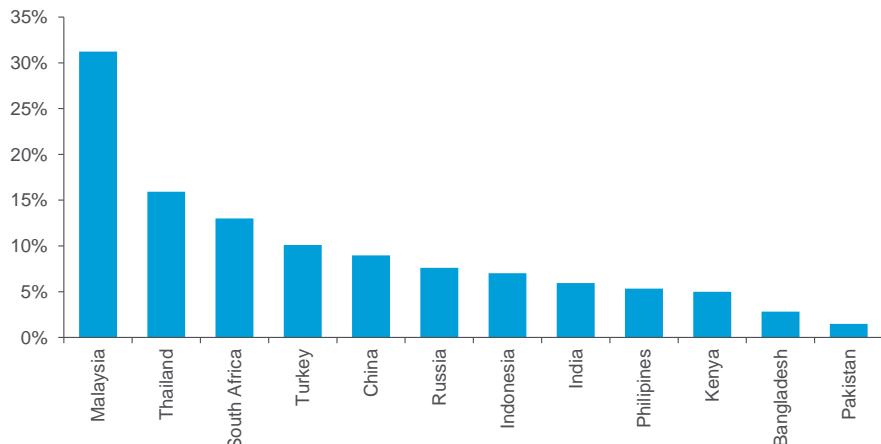
Today, Paytm is already more than just a mobile money wallet, offering ticket bookings, gaming, messaging, online shopping, and financial services — all within a single powerful app. Expertise (on e-commerce) and investments from Alibaba have helped Paytm manage the marketplace model and expand in e-commerce. Paytm has been able to integrate over a million Chinese sellers from AliExpress onto its platform. In 2016, Paytm and Alibaba launched a partnership that would allow Chinese merchants to use Alipay while selling through Paytm. In return, Paytm got access to Alibaba's cloud computing arm Alicloud (also known as Aliyun).

### 4. Mobile Lending

Consumer and SME lending is another segment that mobile money providers are looking to expand into following on Safaricom's success in Kenya. They are aiming to cater to populations that have traditionally been underserved by larger corporate-focused banks in frontier markets, by leveraging on their wealth of customer data to facilitate loans through partnerships or in competition with financial institutions.

### Informal Trumps Formal and Highlights Untapped Demand

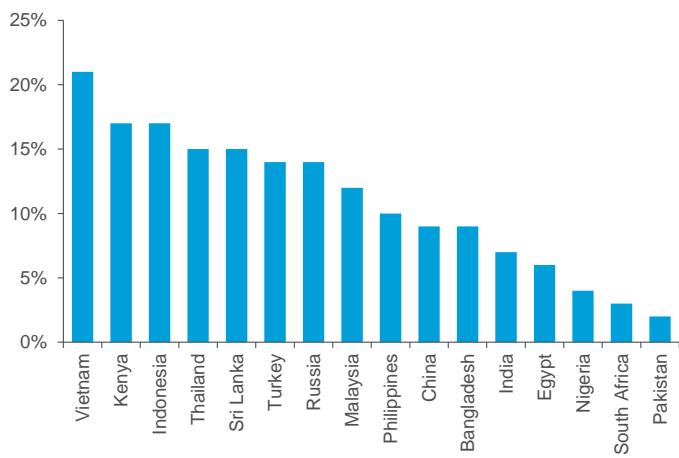
Consumer borrowing (excluding mortgages) from financial institutions in frontier and select emerging markets remains small as a share of GDP, with Pakistan and Bangladesh the lowest in our sample, and the Philippines, India, and Indonesia also coming in <10%.

**Figure 94. Consumer Lending/GDP (2017)**

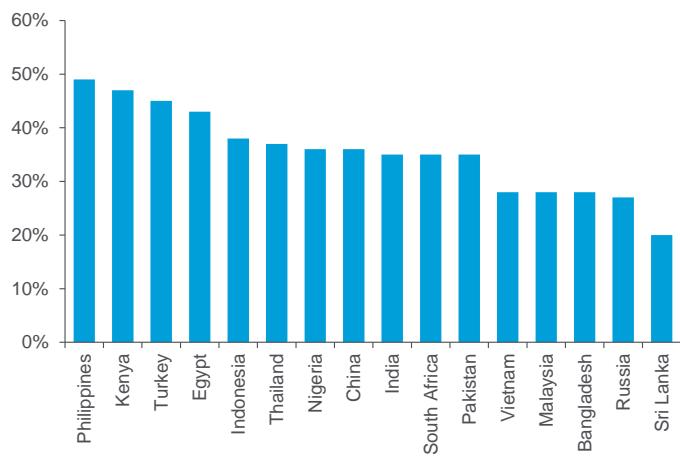
Source: Citi Research, Central Banks Data & Bottom Up Analysis, excluding Mortgages

A more mixed picture appears when looking at the share of the adult populations that has borrowed from a financial institution, with Kenya (17%) leading many emerging markets according to the World Bank Survey, thanks to the prevalence of small-ticket mobile loans.

Meanwhile, the proportion of adults that have borrowed from non-financial institutions reveals latent demand for consumer borrowing, with the Philippines, Kenya, Egypt, and Turkey topping our sample. Whether from friends and family, informal savings societies (like the Chamas in Kenya) or store credit, the data indicates that lack of supply of credit rather than an absence of demand is largely to blame for the dearth of borrowing.

**Figure 95. Borrowed from a Financial Institution, 15+ yrs, %, 2017**

Source: World Bank Findex Report 2017

**Figure 96. Borrowed from Other Sources, 15+ yrs, %, 2017**

Source: World Bank Findex Report 2017

## Small Tickets/Large Volumes as Mobile Lending Takes Off

The premise behind mobile lending is simple, sidestepping traditional credit scoring methods and lending due diligence processes and instead relying on the historical customer mobile use data to generate instant credit ratings. The loans disbursed tend to be micro and focus mainly on retail and SMEs borrowers, usually with short durations (less than 30 days). Charges tend to be steep with high rates of interest and additional loan facilitation fees. While charges are generally fixed, providers have begun experimenting with offering lower rates on repeat loans or following referrals by existing customers with good credit histories.

### Case Study: Mobile Lending in Kenya

Today the most advanced mobile lending ecosystem is undoubtedly found in Kenya, thanks to high mobile money penetration rates, a hands-off regulator and successful partnerships between financial institutions and telco providers. The market is mainly split between the larger volume bank offerings which are available on Safaricom's USSD platform through revenue sharing agreements (like KCB/M-Pesa & Mshawari), the competing bank products like Equitel through partnerships with other Telcos, and the smaller FinTech startups which are only available for download as apps (like Branch, Tala) and raise funds on the open market.

Safaricom's Mshawari was the first product available in 2012 and is the market leader, having disbursed over \$230 million to 21 million Kenyans, receiving on average 300k applications a day and approving more than half as of December 2017. Non-performing loan (NPL) levels tend to be low, with KCB/M-Pesa registering an NPL ratio of only about 3%.

The proliferation of mobile loan providers in Kenya has finally attracted regulatory scrutiny though, with a new draft fiancé bill covering mobile lenders for the first time. Alongside fears of a credit bubble and loose lending standards, complaints have included "unduly high" borrowing rates and a sharp rise in the number of Kenyans blacklisted by the central credit bureau over small sums. The industry should witness a shakeout of smaller players post implementation of the bill, which introduces oversight and now explicitly includes mobile loans in the regulatory upper limit on lending rates (CBK benchmark rate+ 400bps or ~13% annualized).

### 5. Saving, Insurance and FX Products Widen Choice & Availability

Interest-bearing deposits are a standard offering today by mobile money providers in most markets, allowing customers to lock in yields, with the operators depositing the funds with a partner bank and earning a spread. Health & life insurance products have also proliferated, allowing users to be insured with the simple tap of a button and a debit from their wallet.

In China, leading BigTech/FinTech companies such as Alibaba and Tencent offer users online money market funds (MMFs) called Yu E Bao and Licaitong, respectively. These products allow users to divert any unused balance deposited in their mobile money wallets into short-term fixed-income instruments with minimal transaction costs that can yield returns of up to 4% (vs. about 2% on a 12-month bank deposits). MMFs also help promote financial inclusion with a low investment threshold of just one yuan. Today, Yu E Bao is one of the largest mutual funds globally. Aside from MMFs, Alibaba and Tencent users can also invest in wealth management products and buy insurance using digital platforms.

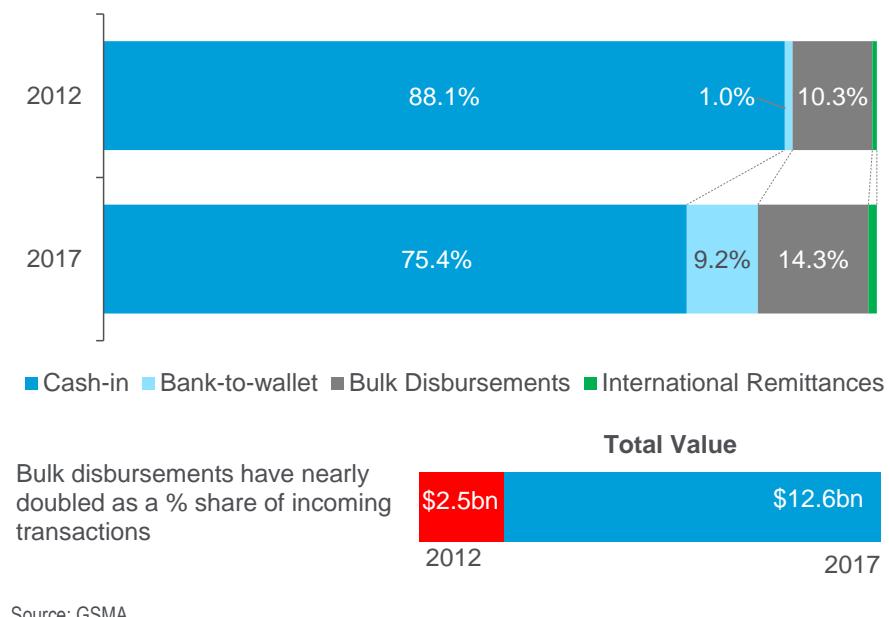
Over in Kenya, Safaricom launched M-Abika in partnership with the Kenyan government in 2017, a tax-free three-year bond sold in small denominations (\$30 minimum vs \$500 for Kenyan treasuries) to fund infrastructure programs, targeting unbanked Kenyans through its M-Pesa platform. While the launch failed to raise its \$50 million target (and may have proven too complicated for retail investors with too long a tenure), it has opened the door to a new avenue for government fundraising globally and new source of income for mobile money users.

In Somaliland where a history of hyperinflation has meant the dollar is the preferred currency of choice, mobile money provider ZAAD introduced a mobile money exchange service in 2018. The service allows users to easily exchange U.S. dollars with Somaliland Shillings directly on their mobile phone without the need to visit an exchange bureau. The service works as an aggregator, allowing users to see the conversion rates offered by various money exchange companies and hence to select the best rates on offer.

## 6. Mobile Money G2P Transfers Offer Solutions

G2P (Government-to-Person) transfers are also one to watch as governments move away from blanket subsidies towards targeted aid schemes. The total value of annual global mobile money bulk disbursements (primarily government related) grew to over \$12 billion according to the 2017 GSMA state of the industry report.

**Figure 97. Incoming Transactions Breakdown per Customer**



The disbursement of government aid (social benefits, pensions, etc.) through mobile money helps cut corruption and waste by cutting out rent-seeking intermediaries. For example, mobile money has been effectively used in Pakistan to distribute funds under government support programs (BISP) and in Kenya for disbursement of agricultural subsidies.

BISP is a flagship poverty alleviation program of the Government of Pakistan, aimed at providing a minimum income support package to the country's most underprivileged families. The female recipients are provided with a monthly social welfare disbursement of about \$2 per day for their households.

Easypaisa (Telenor Bank) developed a solution that overcomes geographical and cultural as well and logistical barriers by bringing financial services to local corner shops (POS terminals), therefore enabling women to register and get their disbursements without having to travel to a bank or even have access to phone.

India is another market where G2P transfers through mobile money accounts could help compensate for deficiencies in banking sector infrastructure. Recently introduced government regulations linking pensions and other welfare payments to bank account ownership have proved problematic in rural areas where branches and ATM penetration still lag, and hence a shift to disbursement though mobile money platforms could help alleviate some of these bottlenecks.

## Chinese Internet Giants Penetrate Into Finance

Taking the first-mover advantage and leveraging their vast user base, Alibaba's Alipay and Tencent's Caifutong dominate the market. In the meantime, more players, such as Internet banks backed by Internet giants (WeBank, MyBank), P2P platforms and online finance platform set up by retail tycoons (Suning Finance, Guomei Finance), have joined the battlefield of online wealth management and financing, and flourished the market with a variety of innovative product offerings.

Among all competitors, we see Internet banks founded by Internet giants are likely to replicate their parent's success in online payment business to other segments of the Internet finance market in light of their cost advantage, customer insight and differentiated client focus.

- Cost advantage thanks to (1) minimal human input required given Internet banks operate without physical branches with their end-to-end processing largely automated through online systems; (2) reduced IT spend leveraging their parents' existing IT infrastructure and expertise; and (3) lower customer acquisition cost in light of the access to the enormous customer traffic on their parent's platforms. According to MyBank's own estimate, their cost of approving one online-loan can be as low as Rmb2.0 (\$3), comparing to over Rmb2,000 (\$300) at a traditional bank.
- Customer insight developed from the large amount of data accumulated on their parents' platforms, improving their ability to conduct targeted marketing and customize product offerings;
- Differentiated client focus at the long tail market (i.e., blue collar workers with below avg. per capita disposable income, micro enterprises and rural sectors) underserved by incumbent banks given the high income/investment threshold deprived these markets' access to products offered by banks. These under-banked customers have created an eager appetite for Internet finance, presenting great opportunities for Internet banks. Noting the gap between the supply and demand for this population's financial needs, MyBank and WeBank put their focus on serving the small businesses & rural sectors, and less prime retail clients in China, and fully enjoyed first-mover advantage of the blue ocean strategy.

In the following section, we study the evolution of the two most successful Internet banks in China, WeBank launched by Tencent and MyBank set up by Alibaba, to understand how their unique positioning & strategy help them navigate and stand out in the competition.

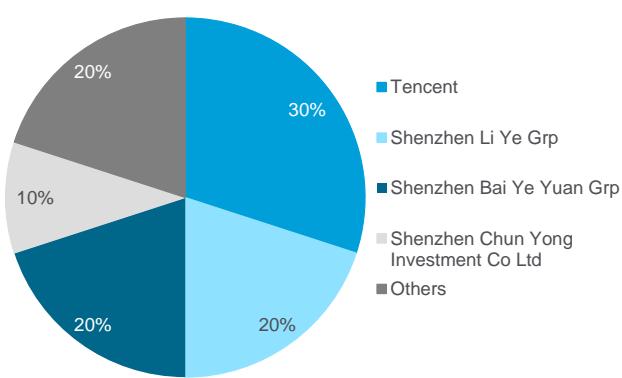
## WeBank (微众银行) – Wins by “Connector” Strategy

With its license approved in December 2014, WeBank, of which Tencent holds a 30% stake, became the first private and online-only bank in China. By penetrating into the over 1 billion users on Tencent's social platforms (WeChat and QQ), WeBank positions itself as an agent between retail customers/small business owners and financial service providers, focusing on the underserved market (76% loans extended to non-white collar borrowers and 92% loans having a ticket size of below RMB50,000 as of end 2017). The bank achieved loan volume expansion of 251% compound annual growth during 2015-17 timeframe, mainly driven by its two blockbuster products, WeiLiDai (微粒贷) and WeiCheDai (微车贷).

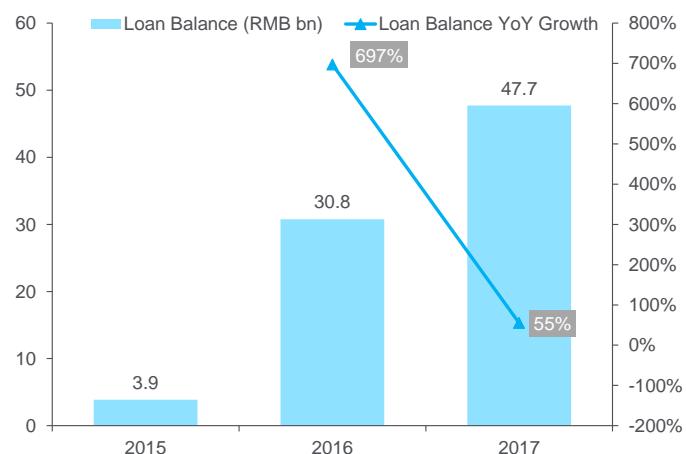
WeiLiDai (微粒贷) was first launched on Tencent's mobile QQ platform in May of 2015 and subsequently on the WeChat platform in September 2015, granting small-sized personal revolving loans. In light of the intensifying deposit competition and its natural disadvantage in attracting deposits, WeBank adopted a joint lending model for WeiLiDai, whereby 20% of the funding came from WeBank and the remaining 80% was provided by collaborating banks. WeBank also performed customer selection and credit assessments leveraging its big data and artificial intelligence capability, and provided reconciliation service for their joint-lenders by building a platform connected to banks' clearing system using blockchain technology. This business model worked out to be a win-win collaboration for both parties, resolving WeBank's funding constraint and at the same time enabling traditional banks to tap into the less-prime borrower market with lower operational cost and less concerns over asset quality. As of the end of 2017, WeBank had formed collaborative relationships with 50 financial institutions and extended loans to over 60 million borrowers cumulatively.

The success of WeiLiDai has also been the key driver that helped WeBank breakeven in 2016. On the one hand, the light asset model improved the banks' profitability (return on assets of 2.17% at the end 2017 vs. 0.92% for Chinese commercial banks during the same period) given lower cost funding (interbank liabilities accounted for 62% of its total liabilities at the end 2017) and less capital deployed when extending loans. On the other hand, the model enabled WeBank to diversify its revenue streams. Unlike most Internet banks that rely on net interest income (e.g. NII accounted for 87% of MyBank's revenue in 2017), given challenges in developing intermediary businesses (e.g. wealth management, advisory) which are usually labor intensive or require physical branch presence for customer acquisition, WeBank was able to generate fee revenue by providing customer selection, risk control, and reconciliation services to collaborating institutions.

WeiCheDai (微车贷) represents another good example of how WeBank realizes its value as the “connector” between retail customers and financial service providers to capture opportunities in China's auto finance market. By collaborating with China's largest second-hand car e-commerce platform Uxin Limited, WeBank gains access to Uxin's client base by offering loans when clients purchase cars on Uxin's platform. Clients are attracted by (1) fast loan approvals, by leveraging its strong data processing capabilities, which helps accelerate customer risk assessment; and (2) competitive interest rates supported by cost savings.

**Figure 98. WeBank: Shareholding Structure, 2017**

Source: iBaogao, Citi Research

**Figure 99. WeBank Grew its Loans at 251% CAGR During 2015-17**

Source: Company reports, Citi Research

**Figure 100. MyBank: Snapshot of Key Products – WeiLiDai and WeiCheDai**

WeLiDai	WeiCheDai
<ul style="list-style-type: none"> <li>■ Product type: Consumer loan</li> <li>■ Credit limit: Rmb500-300,000</li> <li>■ Application via WeChat or QQ platform</li> </ul>	<ul style="list-style-type: none"> <li>■ Product type: Auto loan</li> <li>■ No specific credit limit</li> <li>■ Offers two repayment options: 1) 24-month with no installments; 2) monthly installments at a low interest rate (APR 6.6%)</li> <li>■ Application via deal's website or WeChat platform</li> </ul>

Source: Company reports, Citi Research

### MyBank (网商银行) – Thrives by Serving Under-banked Markets

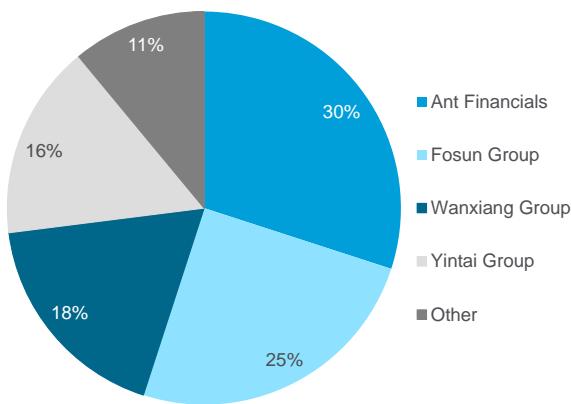
The second Internet bank in China was founded by Alibaba in 2015 with a 30% shareholding through its financial services affiliate Ant Financial. As the pioneering Chinese bank operating entirely on a cloud-based computing platform, MyBank has been focusing on providing financing solutions to the personal business owners, SMEs, and rural-based users on Alibaba's financial eco-system. According to its website, MyBank has provided RMB1.88 trillion (\$290bn) in financing to over 10 million SMEs cumulatively through June 2018, mainly through its flagship products WangShangDai (网商贷) and WangNongDai (旺农贷) which offer uncollateralized loans. Leveraging the huge user base on Alibaba's e-commerce platforms, MyBank recorded a 108% compound annual growth rate in its loan book during from mid-2015 through 2017 and managed to break even in the second year of operation. MyBank announced its Star Plan (凡星计划) at the SME Financing Summit in Hangzhou in 2018, targeting to cooperate with 1,000 financial institutions in China to provide affordable financing services to 30 million SMEs and individual business customers by 2021, and growing its market share in SME financing to 30% from 10% in November 2018 based on its own estimates.

MyBank's advantage mainly lies in its access to Alibaba's vast user portfolio and the advanced data processing and analysis capability it gains by leveraging Alibaba's technology expertise.

■ **Potential to grow its customer base:** With access to over 600 million active users on Alibaba's e-commerce platforms, MyBank gains an advantage in customer acquisition. It also has an advantage as Alibaba gives MyBank preference when credit product providers on Alibaba-controlled platforms select financing partners. Jiebei (借呗), a consumer loan service, opened its access on the Alipay app and borrowers were referred to WangShangDai's loan products upon application. In addition, we believe MyBank's banking license could help it grab market share from non-banking online lenders in light of tightened regulatory control.

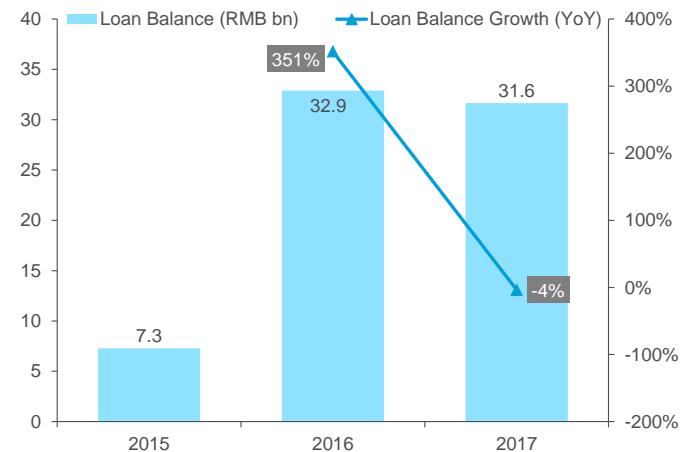
■ **Strong IT capabilities to support customer credit assessment and risk control leveraging QR code-based information:** In light of the all-pervasive adoption of QR codes in the purchases and sales in China, MyBank developed a unique way of gaining customer insight via collecting info on individual business and SMEs from their QR code-based transactions. In this way, MyBank is able to assess the client's profile by analyzing their historical cash flows and conduct risk management through continuous cash flow monitoring supported by its comprehensive data analysis capability.

Figure 101. MyBank: Shareholding Structure, 2017



Source: Citi Research

Figure 102. MyBank Grew its Loans at 108% CAGR During 2H15-17



Source: Citi Research

Figure 103. MyBank: Online Infrastructure and Customer Acquisition Channels

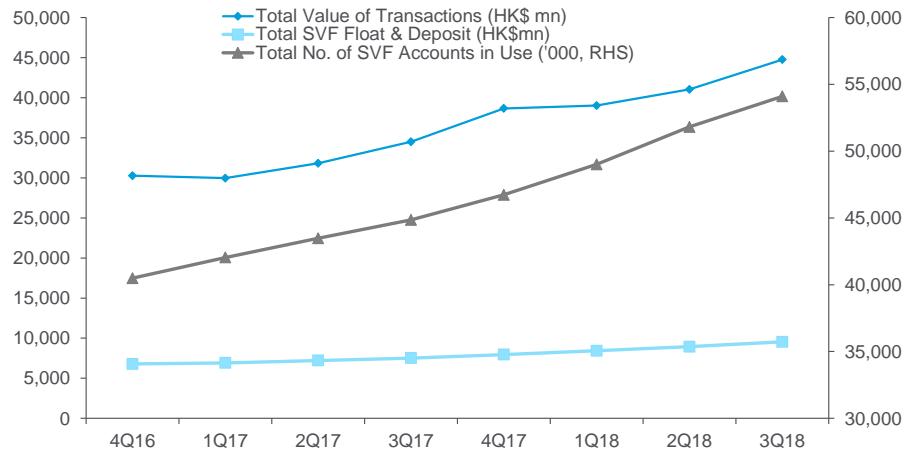


Source: Citi Research

### WeChat Pay HK and Alipay HK – From Payment to Banking

Tencent and Alibaba are among the front-runners for a virtual banking license in Hong Kong. However, they are not totally new to Hong Kong. WeChat Pay was launched in Hong Kong in April 2017 with Alipay HK launched shortly after in May 2017. Backed by Tencent and Ant Financial, respectively, the two operate under a Store Value Facilities (SVF) license. Sixteen licenses have been issued by the HKMA since 2016 while allow licensees to launch digital wallets to facilitate peer-to-peer (P2P) and peer-to-business (P2B) payments. Although credit card remains the preferred way of payment for now, total number of SVF accounts in use has been on a rise.

Figure 104. Hong Kong Stored Value Facilities Statistics

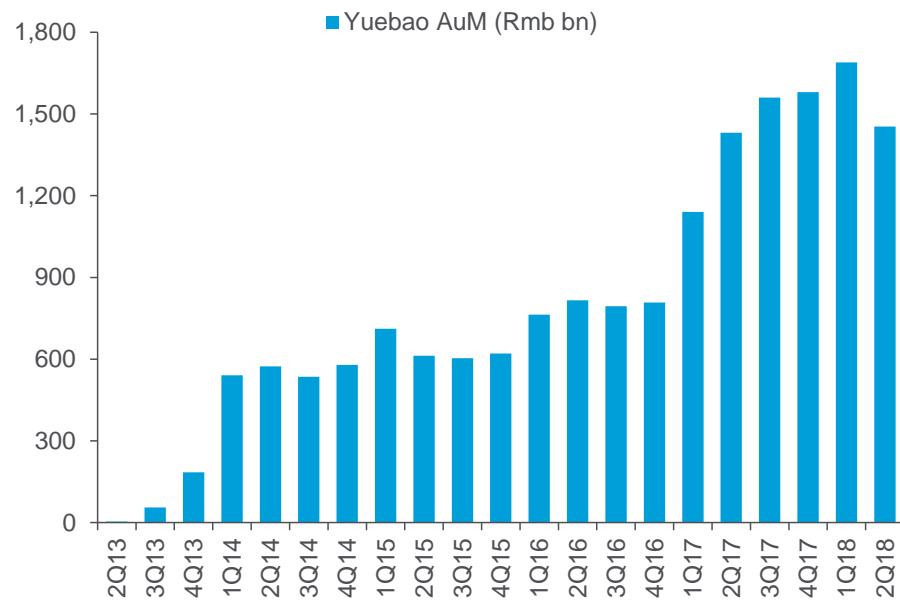


Source: HKMA, Citi Research

By March 2019, Alipay HK's number of users exceeded 2 million and Alipay HK is now accepted by 50k+ merchants. The next step is to widen Alipay HK's adoption to public transport networks. In November 2018, Alipay won the bid to provide QR code mobile payment solution for Hong Kong's MTR railway system. In the future, MTR passengers will be able to scan a QR code or use an MTR app linked to an Alipay wallet. The new QR code-based payment system will be rolled out to 91 MTR stations across Hong Kong by mid-2020. MTR carries around 5.8 million passenger trips per day. Adoption of digital wallets by MTR could further boost Hong Kong's mobile wallet usage.

Payment is only the first stop of their ambition in Hong Kong. After building a sizable user base, they are now looking to expand their product scope by acquiring a virtual banking license. Their Mainland parents, Tencent and Alibaba, already have successful experience running virtual banks in China — WeBank and MyBank. While Alipay HK and WeChat Pay HK are not connected with the systems run by their Mainland counterparts, due to regulatory/privacy issues, very likely Alipay HK and WeChat Pay HK will borrow at least some product features proven popular in the Mainland and implement in Hong Kong as they grow. Similar development roadmap was seen at the U.K. before, where Revolut started off as a FX transfer specialist and later expanded to become a key all-rounded banking disruptor in Europe.

**Figure 105. Yuebao Now Manages Rmb1.5 trn Assets Under Management**

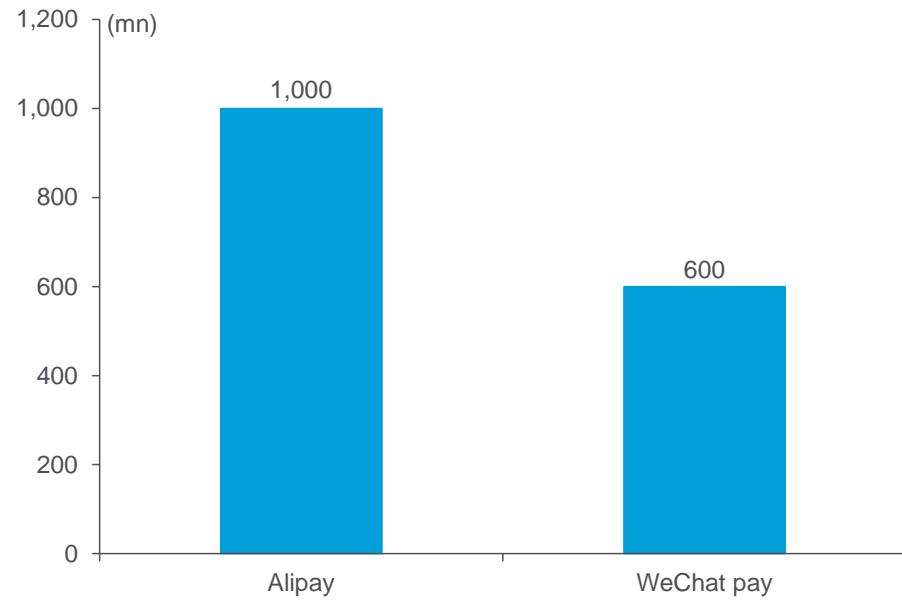


Source: Tianhong Asset Management, Citi Research

We will not be surprised to see these players bringing innovative financial products into Hong Kong. A good example would be Yuebao launched by Ant Financial in Mainland China. Yuebao is a mobile portal embedded in Alipay which allows users to invest in money market funds. It has quickly gained popularity because it offers both higher returns than regular deposits and convenience. One can easily transfer their e-wallet balance, even in small amounts, to funds supported by Yuebao. As of mid-2018, total assets under management at Yuebao reached Rmb1.5 trillion (\$225 billion). Similar products could be launched by these Internet giants in Hong Kong to seize deposit share from incumbent banks.

Another advantage of these players is in cross-border transactions. Tencent and Ant Financial both have payment infrastructure in onshore China and in Hong Kong. Although the systems are separate, they do have the capability to facilitate cross-border payments to the extent that regulations allow. WeChat Pay HK is an obvious front-runner in that regard. WeChat Pay HK now not only supports HKD payments to a wide range of onshore online merchants in China, including Didi (China's leading ride sharing app), Meituan (China's largest group purchase platform), and Dianping (a popular lifestyle website with online purchase options in China), but is also able to conduct direct payments to select shops and restaurants in the Greater Bay Area. WeChat Pay HK would automatically convert all RMB prices into HKD when handling cross-border payment, and will not charge additional fees for foreign exchange conversion. By leveraging their financial innovations and extensive Greater China network, WeChat Pay HK and Alipay HK can likely find a competitive client proposition in Hong Kong's banking market.

Figure 106. Alipay and WeChat Pay – Number of Users

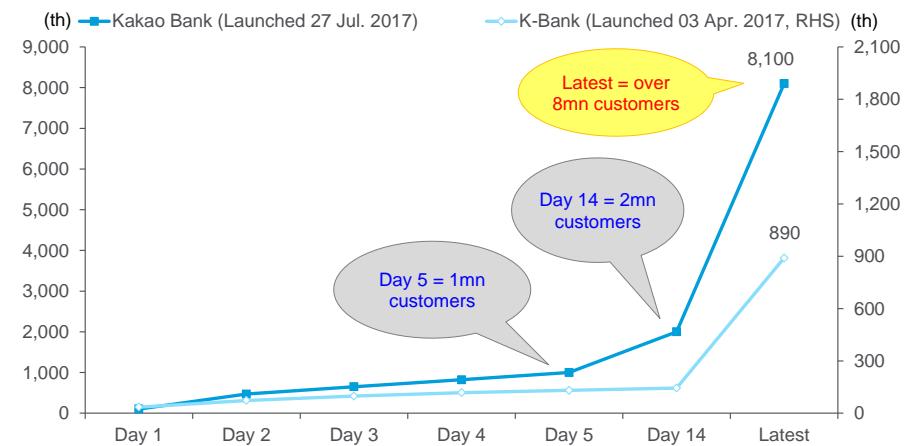


Source: Citi Research

## Kakao Bank in Korea

Korea is a great example of technology companies leveraging their enormous user base to disrupt banking. About five percent of Korea's adults signed up with Kakao Bank, the second Internet bank with two weeks of its launch. One million new clients were on-boarded by day five, rising to 2 million by day 13. To put the numbers in context, K-Bank (Korea's first Internet bank) attracted 550,000 users over the first four months; and DBS Bank's digibank (India) reached 1.3 million users over a year. As of January 2019, Kakao Bank holds 8.1 million users vs 890,000 users for K-bank.

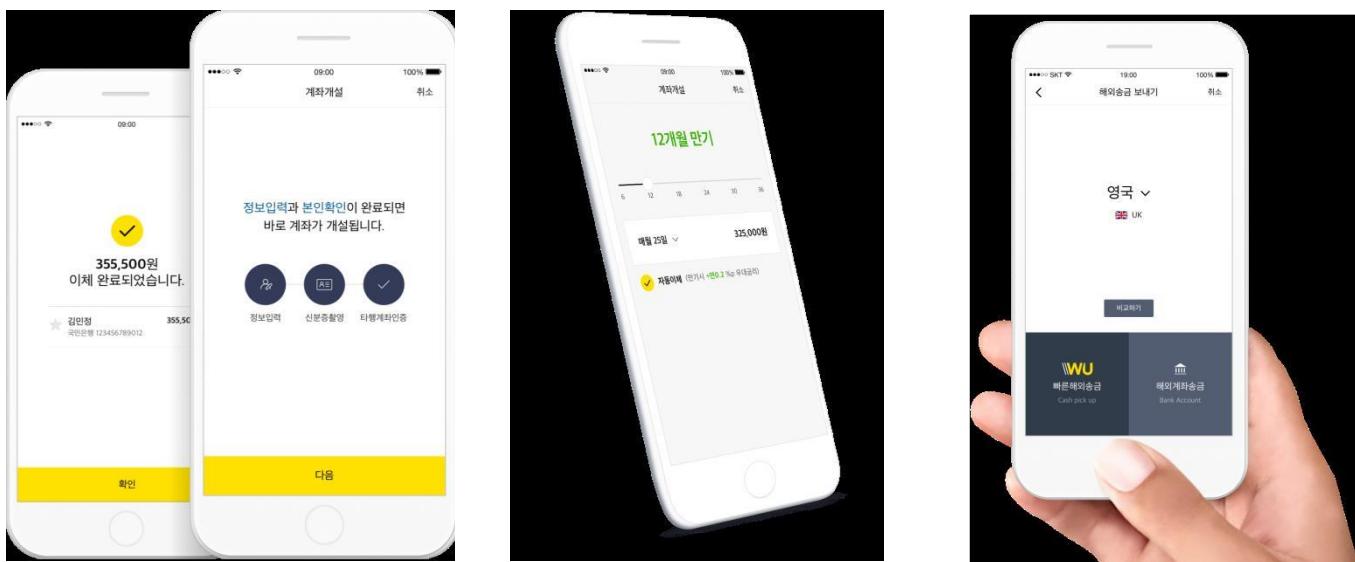
**Figure 107. Korea Internet Banks Aggregate Number of New User Accounts (in millions)**



Source: Press Reports (Business News Daily Korea, Yonhap), Citi Research

Kakao Bank is Korea's second Internet bank (after K-Bank). However, it has proven to be a lot more successful than the first mover, by leveraging KakaoTalk's 42 million monthly active user-base in Korea. Kakao Bank also sets itself apart by enhancing the customers' digital experience at log-on as well as authentication, and by offering more attractive rates/lower fees. Kakao Bank's success is also underlined by the fact that it does not only penetrate into payment, the first outpost seen by many tech companies, but also other conventional banking products such as term deposits and credit facilities.

Figure 108. Kakao Bank –Opening an Account with a Mobile; Mobile Deposits and Savings Accounts; Overseas Remittances

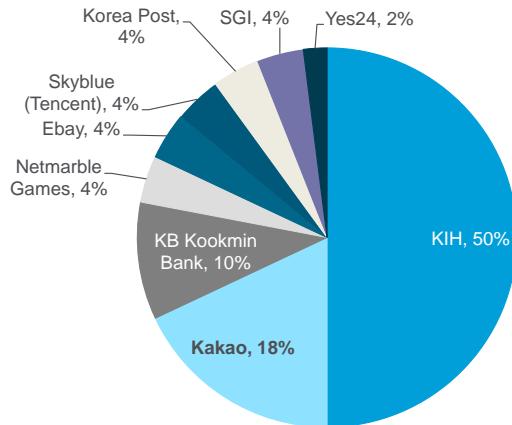


Source: Company website

In contrast to Kakao Bank's explosive customer growth, K-Bank (launched in April 2017) had 130,000 new customers in its first five days and 550,000m after four months. As of the latest data, outstanding loans for Kakao reached W 7,789bn vs. W1,182bn for K-Bank (\$6.9bn vs \$1.1bn); deposits were W 9,359bn (Kakao) vs. W 1,729bn (K-Bank) (\$8.3bn vs. \$1.5bn).

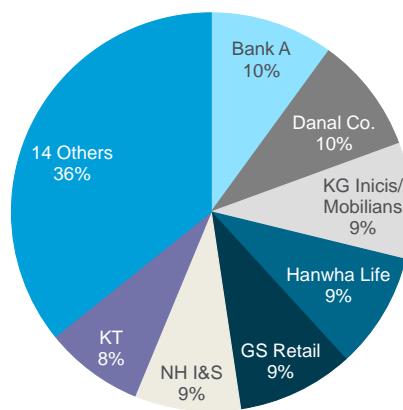
Korea Investment Holding is the single largest shareholder in Kakao Bank (50%), followed by Kakao (18%) and KB Kookmin Bank (10%); with Kakao the major IT player. K-Bank shareholding appears more diversified: with two companies owning the largest stakes at 10%. KT Telecom is the major IT shareholder with an 8% stake. Local regulation limits non-financial company ownership in banks to 4% (10% with special approval). With the implementation of the Internet Bank Special Act in January 2019, non-financial ICT companies are allowed to hold up to 34% stake in banks.

Figure 109. Holding Structure of Kakao Bank



Source: Company reports (as of Sept 30, 2018)

Figure 110. Holding Structure of K-Bank



Source: Press Reports (Business News Daily Korea)

In terms of product offerings, Internet banks in Korea are able to provide fairly comprehensive retail banking products including term deposits, domestic/overseas debit cards, and payment and basic loans, comparable to those traditional banks. A key differentiator for Internet banks like Kakao Bank is that new account opening is completely online, with no need for physical certificate verification. Also, these Internet banks tend to offer marginally better rates on both deposits and loans. Kakao Bank and K-bank both use non-conventional data feeds (shopping history, mobile phone bills for example) to improve credit assessment.

**Figure 111. Features Comparison: Internet-only Banks vs. Traditional Banks**

	Internet Banks		Traditional Banks
	Kakao Bank	K-Bank	
<b>1. Accessibility</b>			
Account creation	Smartphone app (*verification certificate not required)	Smartphone/online (*verification certificate required)	Mostly offline (*verification certificate required for online/smartphone)
<b>2. Pricing</b>			
Savings deposit rates	1.51%	max 2.10 - 2.50%	1.64% avg
Credit loan rate	3.76% (as of Sep.2018.)	2.67-5.50% (new loans suspended from Jul 2017)	4.45% avg
Transaction fee	ATM: no charge until end of June 2019 (All banks, cvs, subway ATMs) mobile/online: no charge	ATM: no charge (GS25 cvs ATM) mobile/online: no charge	ATM: W700-1,200 per transaction mobile/online: W500 per transaction Branch: W3,000-4,000 per transaction (per W10mn wiring)
Overseas fund transfer fee	W5,000/transaction (up to \$5,000/ transaction) W10,000/transaction (more than \$5,000/ transaction)	n/a	Average W40,000/transaction (via mobile app)

Source: Company websites, Citi Research

Internet banks are subject to similar regulations as are conventional banks in Korea. The current BIS capital requirement is 8% (Basel 1). Kakao Bank has its BIS ratio at 15.67% as of September 2018.

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