HEYÓKHA BROTHERS

Seeing Through Accelerating Change

What you cannot see in the world is far more powerful than anything you can see.

-T. Harv Eker-

4Q 2017

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Heyokha's ecosystem

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What we have learned this quarter

Seeing Through Accelerating Change

In the digital era, movies centering the genre of the future are multiplying. But what will the future be like?

Different movies have different takes on the future, mostly based on extrapolation of the technology that we have today, from intelligent machines replacing humans to manufactured humans.

One of the most interesting franchises is Netflix's latest series, *Black Mirror*. It tells different individual stories of people living in a world with elevated technology and just how different it is to have artificial intelligence in our lives right now.

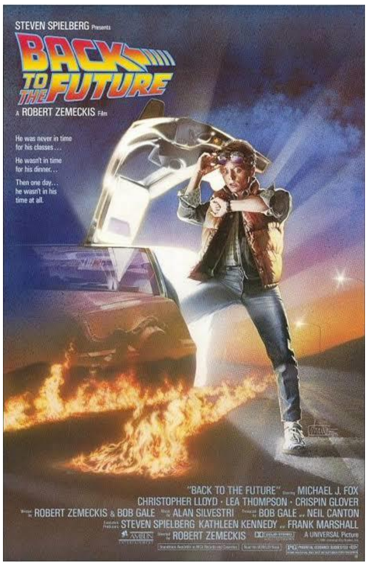
Amusingly, the stories in *Black Mirror* are set in the *not too distant future or even in an alternative present setting*. Yet the dramatic changes in the series, typically daunting ones, feel believable. The key message of the stories is that technology hits us like a speed train and it is accelerating.

The future portrayed in Black Mirror may not be so far away

Black Mirror's Metalhead vs. real Boston Dynamics' dog. In Metalhead, the AI enabled "guard dog" relentlessly pursuing the perpetrators. It seems reasonable to expect that extreme changes to occur in a much shorter time frame?
Source: Netflix, Boston Dynamics

"If technology is a drug – and it does feel like a drug – then what, precisely, are the side effects? This area – between delight and discomfort – is where Black Mirror, my new drama series, is set. The 'black mirror' of the title is the one you'll find on every wall, on every desk, in the palm of every hand: the cold, shiny screen of a TV, a monitor, a smartphone."

-Charlie Brooker, creator of Black Mirror-



As a comparison, the iconic 1985 science fiction movie *Back to the Future* needed to leap forward 30 years into 2015, to make the future setting fascinating. The legendary 1982 *Blade Runner* used 2019 setting or 37 years into the future to make it stirring but believable at the same time.

Black Mirror does not need those decades. Few years, at most, will do the trick. The future is getting nearer, and we feel it coming faster than ever now.

The image of the near-future is unnerving as there is more recognition that human beings will no longer be the most intelligent beings on this planet. It will be impossible to comprehend the rate of acceleration in machine learning.

As data increases, the impact of artificial intelligence will be greater. The third wave of AI has the ability to learn autonomously in real time and incrementally from its own mistakes.

The case in point for the future of machine learning is DeepMind's Alpha Zero in the game of chess. AlphaZero managed to achieve a superhuman level of play in Chess within 24 hours of "tabula rasa" self-play. AlphaZero then beat the reigning computer champion, Stockfish, in Chess within four hours of self-play.

It is even more fascinating that AlphaZero sometimes made seemingly crazy sacrifices of high-value pieces, such as offering up a bishop and queen to exploit a positional advantage to gain a victory. Because AlphaZero was completely self-taught, it was not bound by the traditional approach of assigning a value to pieces and trying to minimise losses. AI can now be its own teacher—acquiring superhuman capability without any human input.

"If you had on Facebook the friend lists that I have, which is all chess players, I can only see posts which say AlphaZero is crazy. You know it's like aliens have come from to Earth. The way it is playing I can't even imagine Chess is being played like this…AlphaZero could completely change the way Chess is being played now."

-Sagar Shah, International Chess master-

This shift in the futuristic movie industry reminds us of American inventor Richard Buckminster "Bucky" Fuller's Knowledge Doubling Curve. He noticed that until 1900 human knowledge doubled approximately every century.

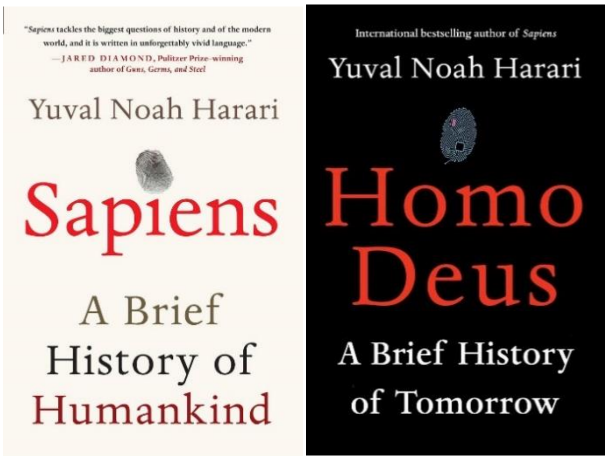
By the end of World War II, knowledge was doubling every 25 years. On average, human knowledge is currently doubling every 13 months. (As an aside, it is interesting to re-read IBM's *The toxic terabyte*, which argued that knowledge is power, but only if it can be extracted quickly and efficiently from an ever-growing mass of data. Many organisations now see their information stocks snowballing beyond their ability to manage data).

With this speed of development, we should be able, at least theoretically, to understand the world better and better. But often the very opposite is happening. The acceleration of the accumulation of knowledge leads to faster and greater upheavals. Consequently, we are less and less able to make sense of the present or forecast of the future.

This paradox of knowledge is discussed very persuasively in *Homo Deus* book by historian Professor *Yuval Noah Harari.* We discuss more below.

The endgame: the era of superhumans or data religion?

Heyokha team recently read *Homo Deus: A Brief History of Tomorrow* by *Yuval Noah Harari*. The book is the sequel to his previous epic book *Sapiens* (we discussed Sapiens in [our 3Q2015 report](#)). We summarise our key learning from the book in Appendix I on page 26.



In *Homo Deus*, Harari points out that, thanks to technology and phenomenal economic growth, more people die today from eating too much than from eating too little. He argues that humanity's next targets are likely to be immortality, happiness and divinity. Having reduced mortality from starvation, disease and violence, Harari predicts we will now aim to *overcome old age and even death itself*.

And having raised humanity above the "beastly" level of survival struggles, we will now *aim to upgrade humans into gods, and turn Homo sapiens into Homo Deus*. The book also predicts the emergence of two completely new religions: *techno-humanism* and *data religion*.

Techno humanism still sees humans as the apex of creation. It agrees that Homo sapiens as we know it has run its historical course. Thus, we should therefore use technology to create Homo Deus – a much superior human model. These superhumans will enjoy unheard-of abilities and unprecedented creativity, which will allow them to go on making many of the most important decisions in the world.

If that sounds terrifying, data religion takes it to the next level by arguing that humans have completed their cosmic task and should now pass the torch on to entirely new kinds of entities. Homo sapiens will no longer be the most intelligent beings on this planet.

"It seems like we live an era whereby we have more degrees but less sense. More knowledge but less judgement. More experts, yet more problems. We have multiplied our possessions, but reduced our values."

-George Carlin, stand-up comedian-

Spot the similarity in the pictures below… Are human beings no longer needed? None of these pictures are taken from the *Black Mirror* series, they are already operating in the real world.

Delivery robots have already been commonly used by both Alibaba Cainiao and JD.com.
Source: Alizilia, Pandaily

JD.com drone delivery will start to operate in this year after securing licenses from 10 provincial governments. Also, Dubai has staged a test flight for unmanned flying taxi, aiming to be the first country in the world to adopt flying taxi.
Source: Thecover.cn, Arabianbusiness.com

BingoBox, unmanned convenience store operator already has 200 stores in 29 cities in China. Amazon is also aggressively rolling out Amazon Go to U.S. cities.
Source: TechinAsia, Theverge.com

With futurist Harari predicting that possible end games are the era of data religion or superhumans, investors are facing a huge a challenge on how to invest during this period.

When life feels like a fast-moving train, one can choose to live in denial, pretending nothing is going to change. Some may call tech disruptors "thiefs" or "liars" and tag the whole disruption process as a "cult of disruption-at-any-cost" or a "a structural human failure that had driven many to such despair".

We at Heyokha prefer to be open-minded about these rapid changes. We believe in continuous adaption, unbound by tradition, taking what works and discarding what doesn't. Adapt or be obsolete.

With this backdrop, Heyokha team looks into a few areas that are relevant to the fast-changing business world and thus our portfolio positioning:

1. What is the likely outcome of fintech posing challenges for the financial industry?
2. Is this the end of the physical store as we know it?
3. Is precious metal still relevant as a store of value during the era of blockchain and digital gold (crypto-currency)?

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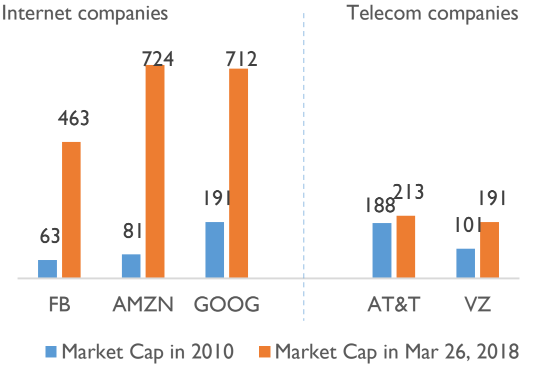
#1: The world in a fast train: what is the likely outcome of fintech posing challenge for the financial industry?

Lessons from Chinese telcos and internet sectors

To understand the world subject to accelerating change, we want to observe the lessons learned from leading telecom vs. internet companies in the US and China.

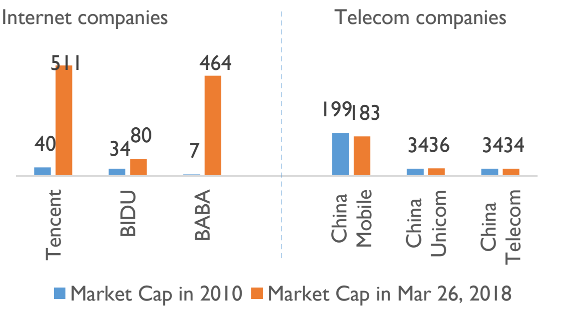
US internet vs. telcos market cap



Source: Bloomberg, Heyokha

We use 2010 as our base year since this represented post GFC era. In that year, AT&T had a market cap that was almost equal to Google. Eight years later, Google commanded a market cap of more than US$700bn or approximately 3.3x AT&T's market cap.

Chinese internet vs. telcos market cap



Source: Bloomberg, Heyokha

The pace of changes is even more rapid in China. In 2010, China Mobile alone had a market cap of 2.5x Tencent, Baidu, and Alibaba combined. Telco stocks were very popular as they represented the proxies to benefit from smartphone penetration and internet data consumption.

Fast forward to 2018, the reverse is true. Tencent alone commands a market cap of almost twice the market cap of China Mobile, China Unicom, and China Telecom combined.

What happened?

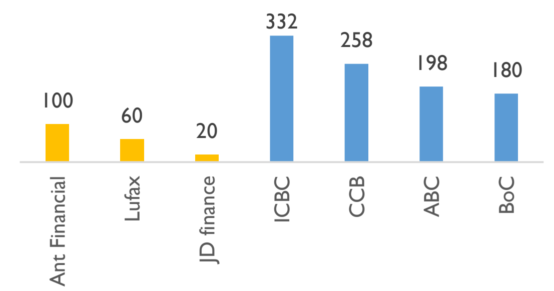
The telecom companies were on the top of the pyramid selling voice and data packages to their customers. But they are not able to monetise the data because the reality is that they have very limited data that can effectively profile their customers.

Then came the Over the Top (OTT) Internet players, such WeChat and Alipay, where they were able to collect a broad set of data of their users and monetise it. As a result, telecom companies have essentially become "dumb pipes".

The next big question: will the banks too destined to become the next dumb pipes?

Chinese fintech valuation vs. Banks mkt cap

In US$ billion



Source: Bloomberg, Techcrunch, Heyokha

The phenomena as described by the charts above does beg the question of how the traditional financial firms will fare in the era of disruption by the nimbler fintech challengers. Again, China with its explosive growth in e-wallet and other digital financial products offers an interesting case study.

Banks arguably have more data than the telecom companies. Unfortunately, looking at the major banks, most do not have the culture, mindset, and ability to monetise this data. Then, there is this big wave of competition from fintech start-ups with data and data-mindset.

With the infection point being reached of e-wallet overtaking banks card, it is just a matter of time before these fintech companies starting to erode the role of traditional banks. Assuming this trend to continue, eventually banks could end up just as a channel of funding, hence margin shrinks.

With the recent billions of dollars capital injection from Chinese tech giants, Indonesian e-commerce sector is certainly in a much better position, both operationally (with the technical assistance from the Chinese tech firms) and financially.

How fintech have impacted the Chinese banks

As discussed, it is probably best to look at China's playbook to get a glimpse of the future in this fast-changing world.

Also, given that both China and Indonesia share low banking penetration (i.e. low debit/credit card penetration, less developed financial products), and considering that Chinese tech giants are making inroads in Indonesia's tech space, we believe Indonesia could follow the same path as China.

Alipay and WeChat Pay QR code can be easily found even in Mom & Pop shops in a small city like Lijiang, Yunnan province.

Source: Heyokha

We think that the key catalyst lies in the success of the e-wallet because many Chinese fintech companies such as Alipay and WeChat Pay relies heavily on their e-payment platform. They have dramatically changed the landscape of China's financial industry, especially in the areas of payment, borrowing, and investment.

List of Chinese fintech firms, many of them are unicorns. Some of them are providing services that overlap with banks.

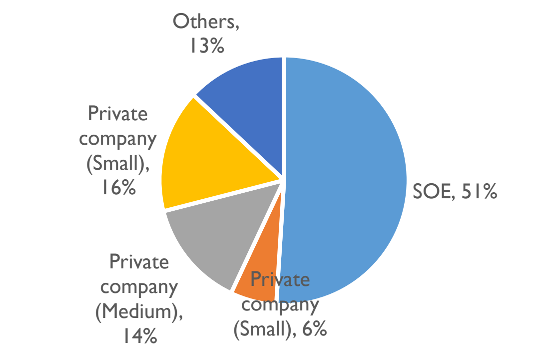
Source: Oliver Wyman

Above is a list of Chinese fintech unicorns. They provide a wide range of banks and financial services comprising of consumer financing, P2P lending, supply chain finance, wealth management, insurance, and many more.

What happened in China?

I) Consumer banking is not the traditional forte of giant Chinese SOE banks

Chinese banks loan portfolio



Source: CLSA

More than half of Chinese banks' total loan portfolio goes to the SOE lending, while Chinese fintech firms are focusing on non-SOE lending. Although the competition is less direct so far, this represents lost opportunities for Chinese banks.

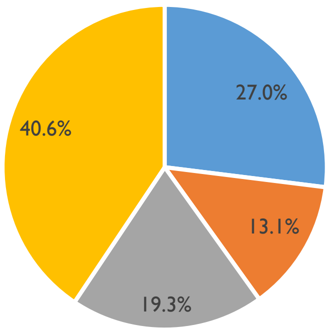
Having said this, going forward it is likely that we are going to see more direct competition between banks vs. fintech, as fintech firms keep expanding their verticals. For instance, WeChat has started WeBank and Alipay has MYbank; this could take away some business from Chinese Banks.

Although the size of WeBank and MYbank are still small, we should not underestimate them. By looking at how fast Yu'e Bao can become the largest money market fund in the world, we certainly can't underestimate how powerful the tech giant's ecosystem is.

II) Chinese banks' fee and commission incomes start to decline

Already, banks are starting to slowly feel the pinch of growing customer acceptance of fintech products. As a result, banks are starting to see their fees and commission received from marketing WMP and mutual fund subscription declining.

Top 4 Chinese banks fee & commission income breakdown

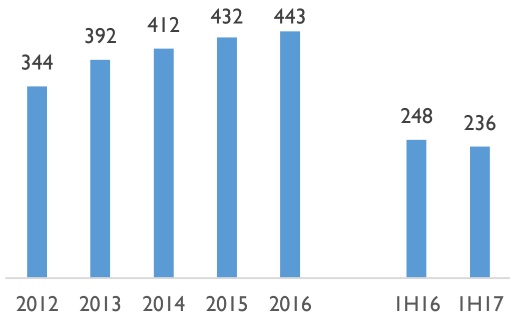


Source: ICBC, CCB, ABC, and BoC interim report 2017

Based on 1H17 financial statements, the big four Chinese SOE banks (ICBC, CCB, ABC, and BoC) experienced declining net fees and commission income for the first time in five years.

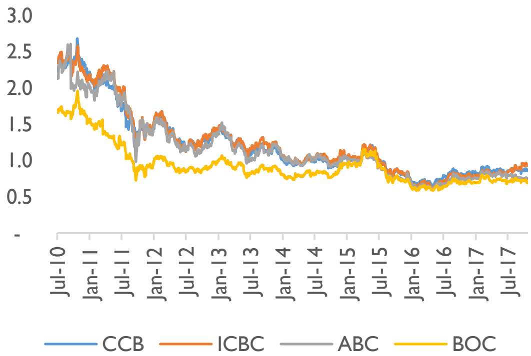
The key item that drags down their net fee and commission income is fewer fees from wealth management subscription and agency services. While there is no definite explanation by the banks, we believe that competition from Alipay, WeChat Pay, and other Chinese fintech firms is a big part of the equation.

Top 4 Chinese banks fee & commission income in RMB billion



Source: ICBC, CCB, ABC, and BoC interim report 2017

Top 4 Chinese banks P/B multiples



Source: Bloomberg

We believe that the verticals will continue to expand as China still has a largely unbanked population and a less developed financial market.

Chinese fintech firms, with all the data advantage, should be in a better position to tap the potential of the country's unbanked market. Amongst other reasons that's why Chinese banks are still trading at lower Price/Book multiple relative to other Asian banks.

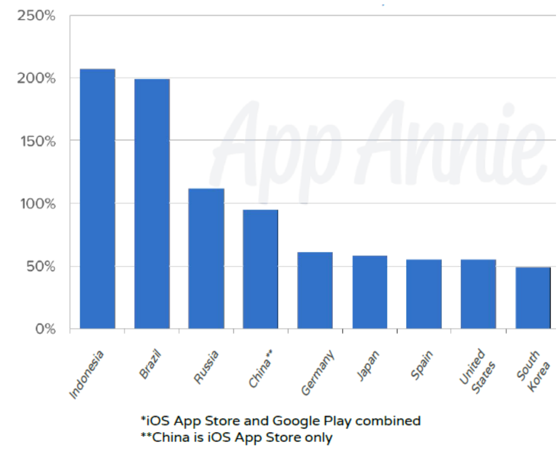
Indonesian fintech: early days, digital wallets are about to take off?

The speed of customer acquisition amongst leading Indonesian fintech companies is simply mind-blowing. Based on App Annie, Indonesian finance app download growth is the fastest in the world in 2015-2017.

Granted that it came from a low base. Also, it does not automatically translate to MAU. Still, it indicates that many Indonesians are willing to try and explore the fintech app. The explosive growth of Indonesian fintech industry seems to be around the corner.

Indonesia finance app download is the fastest in the world

% growth in finance app downloads (2015-2017)



Source: App Annie

Learning from the Chinese experience, the first stage of this exponential growth should be the boom in the digital wallet platform. For now, the clear leader in this space is Go-Jek, the country's first unicorn.

Out of twenty million Go-Jek active users, about half of them are Go-Pay (e-wallet, one of Go-Jek's many verticals) users. This means that Go-Pay is second only to BCA's sixteen million accounts.

It is worth noting that while BCA was founded six decades ago, Go-Pay only started last year. At this rate, it will take only a few more months before Go-Pay can overtake BCA in terms of number of customers.

Just like what Alipay and WeChat Pay did, Go-Jek is targeting Go-Pay to be usable outside of Go-Jek ecosystem (including other platforms and offline stores) in 2018.

This will potentially accelerate Go-Pay user acquisition and give more reason for users to put more money in their Go-Pay account.

Service type	China	India	Singapore	Indonesia	Malaysia
Payments/ remittances	40%	20%	4%	1%	1%
Lending	14%	5%	2%	2%	2%
Personal wealth management	5%	3%	1%	2%	1%
Insurance	35%	2%	2%	1%	1%
	Highly Disruptive	Material Threat	Emerging Threat	Watch List	Remote possibility of disruption

The percentage of banking/financial services customers using FinTech services. Still in its early days, but as we discussed above, this is likely to change very quickly.
Source: DBS Banks, 2016

Again, by referring to the case of China, we can reasonably expect fintech to start becoming very popular once there is an e-wallet app that is widely used in the country. Why?

1) Less KYC (Know Your Customer) requirement. The moment one has an e-wallet, he/she would have already done most of the KYC during the registration process in e-wallet.

2) Credit scoring availability, which will accelerate loan approval to a matter of seconds.

The two reasons above will give fintech firms valuable edges over mainstream banks. Speed and less manual admin works (thanks to digitalisation) will translate into favourable client experience.

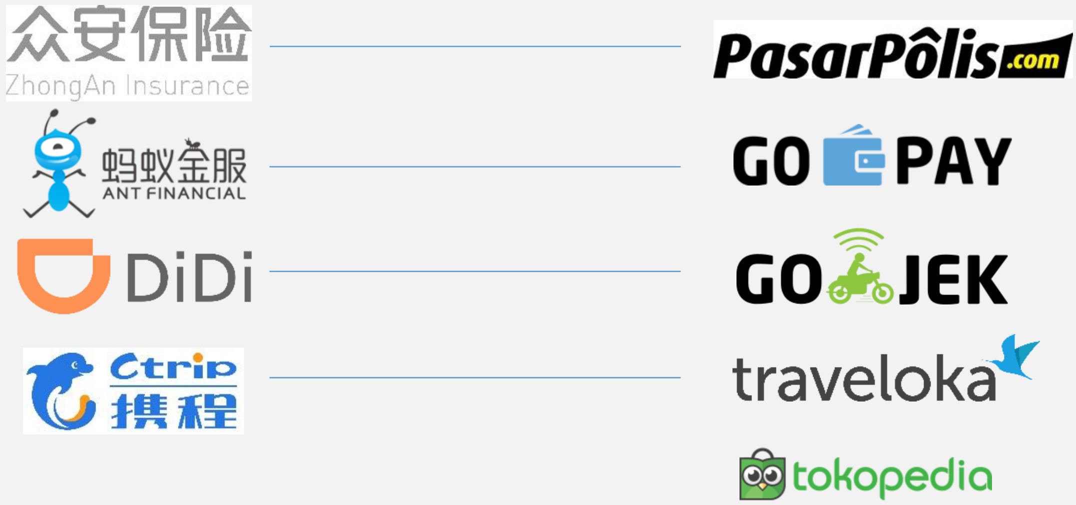
Also, banks will naturally have difficulties to provide lower fees compared to what fintech firms can offer, as they need to manually collect and review both KYC and credit scoring data.

Once the likes of Go-Pay is widely accepted in other platforms and offline stores, there will be less reason to own a debit card issued by banks. Less demand for debit card means lower income for banks.

Also, many transactional fees will be foregone as users can easily transfer money via Go-Pay, which will only take seconds. In China, UnionPay (Chinese largest payment network) experienced declining revenue in 2016 for the first time.

Dejavu?

In the insurtech space, Indonesia is also catching fast. In China, there is Zhong An. In Indonesia, there are also a few popping up and the more interesting one would probably be Pasar Polis. Based on the most recent news, Pasar Polis is said to have raised capital from Traveloka, Tokopedia, and Go-Jek. Hence in insurtech space, it seems like Indonesia is also following China's steps.

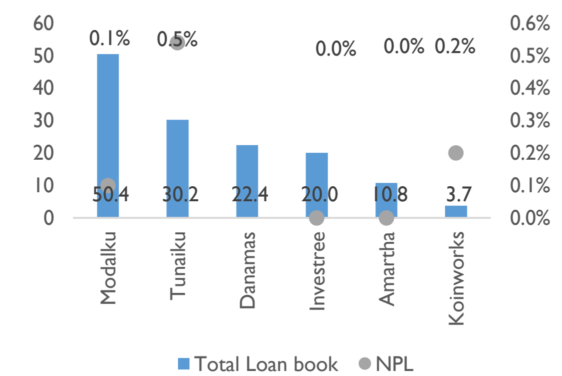


Looking at the list of the Indonesian fintech association 124 members, we can say that the majority are targeting peer-to-peer (P2P) lending. It is true that the size of P2P lending is currently still small.

Furthermore, the credit scoring model is yet to be proven given the current NPL data is still too small to make any conclusion. However, we believe the credit scoring model will continue to improve as there will be ever-growing data from e-commerce and e-wallet platforms.

Indonesia major P2P lending and crowd funding loan book and NPL

In US$ million



Source: Company websites

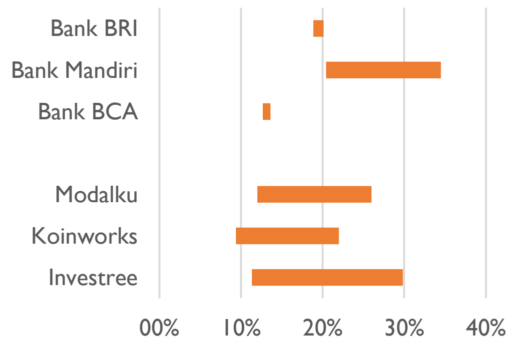
Competition in the P2P space is very intense and it is only natural to see many models failing. However, fierce competition will put the winner of the fintech race in a very good position to seriously challenge incumbent banks' long dominance.

There are more and more fintech firms that are aiming to originate unsecured smaller sized loans. Apparently, it is not only local Indonesian start-ups who are active in this space. Chinese startups have been very aggressive in expanding their business to Indonesia especially after Chinese government curbed the unsecured small size loan there.

Just like in the case of e-wallet, P2P will also enjoy the digitalisation edge, at least theoretically as P2P lenders do not require an army of credit analysts and KYC officers.

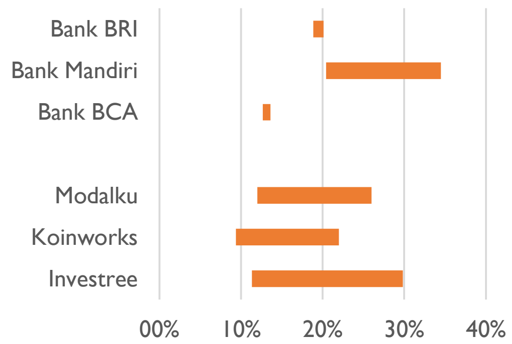
P2P Lending rate is quite comparable with Indonesian major banks

Unsecured loan lending rate annualised



Return for P2P investor is significantly higher than major banks deposit rate

3-month time deposit rate annualised



Source: Cermati.com, company websites

Investors in P2P lending and crowdfunding receives investment yield ranging from low teen to as high as 25%. That is definitely way higher than the typical deposit rates offered by Indonesian banks.

Whether this represents a good long-term investment for the owner of the funds or not, such a yield gap ought to mean some money will leave banking system and go to P2P system.

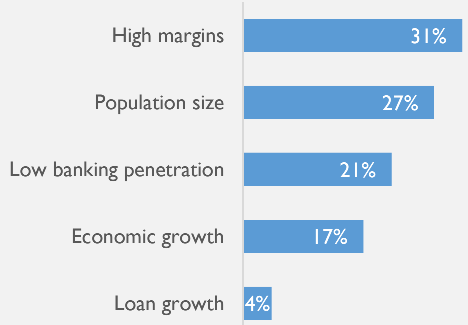
In the consumer finance space, there are a couple of strong contenders to dominate these space such as Kredivo and Akulaku. This could be a major threat to the multi-finance companies who are aiming at electronics and home appliance financing.

Your margin is my opportunity

It is widely known that Indonesian banks command one of the highest net interest margins (NIM) in the world, which makes it even more attractive for fintech to enter. There are some possible explanations for this phenomenon, from a less than ideal legal system to lack of competition argument.

What are the factors that make Indonesia more attractive than other markets in Southeast Asia?

#1 ranked response



95% of respondents who believe Indonesia is more attractive than other markets in Southeast Asia

Source: PwC Indonesia banking survey 2017

"Your margin is my opportunity"

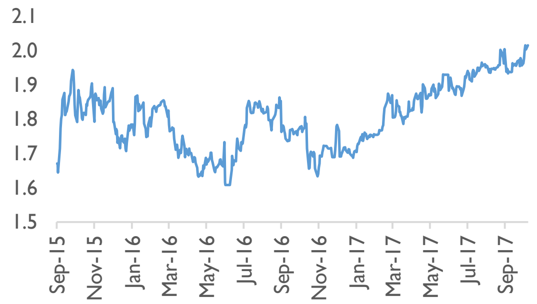
-Jeff Bezos-

While the development of fintech is about to change our way of life like a speed train, it is interesting to observe that in Indonesia, banks' stock prices have continued to soar on the back of series of rate cuts, falling government bond yields, and passive fund flows.

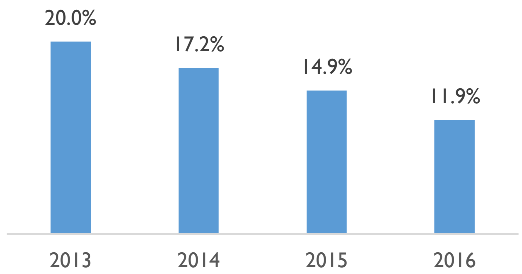
The Price to Book Value (PBV) multiples of Indonesian banks have expanded by 25% in the less than a year, despite a structural decline in Return on Equity (ROE), probably caused by Basel III implementation.

The impact may not be fully realised yet given the full implementation will only occur in 2019. There is also a potential impact from MiFID II, although the impact is quite limited for Indonesian banks.

Jakarta financial index P/B multiple continue to re-rate despite falling ROE



Jakarta financial index, structural ROE decline?



Source: Bloomberg, Heyokha

We wonder if the valuation rerating of Indonesian banks has not taken into account the fintech storm that is about to change the landscape of Indonesia's financial sector.

The intriguing part about this discussion is that we have not even touched upon the subject of blockchain. It seems that blockchain is getting a strong momentum with 33% of all blockchain projects happened in the past 20 months.

Blockchain is said to be where the 4th Industrial Revolution is heading, after AI, robotic, and the Internet of Things. Implication on financial service and other supply chains should be profound, thus it makes sense to follow the development in blockchain closely.

Blockchain revolution, a mighty disruption

Blockchain is a distributed ledger system which allows secure and unalterable data recording. Essentially, blockchain technology allows parties in a transaction to share a single ledger.

This removes redundancy as previously each party needs to create their own ledger. Blockchain will significantly increase execution speed, lower cost, and reduce errors of data recording and processing.

In addition, blockchain can also have "smart contract" capability, allowing contracts (including payments) to be executed automatically if certain criteria (set by the creator) are met.

Use case	Examples	Description
Supply Chain Management and Digital Product Memory	IBM and Maersk	Tracking of containers during the shipping process
	Provenance	Recording of all important product information throughout the entire
	Everledger	Registers certifications and transaction history of diamonds on
Internet of Things and Industry 4.0 applications	Factom Iris	IoT device identification over
	Super Computing Systems	Sensors that timestamp data on the blockchain to save them from
	Tile Data Processing Tilepay	Marketplace to allow customers to sell their data from IoT devices
	IOTA	Cryptocurrency and blockchain protocol especially developed to meet the demands for IoT applications
	IBM Watson IoT	Platform to save selected IoT data on a private blockchain and share it with all involved business partners
3D printing	Genesis of Things	Platform to enable 3D printing via smart contracts
	Moog Aircraft Group	Ensuring safe 3D-printing of aircraft parts via blockchain

Source: Frankfurt School Blockchain Center, Medium

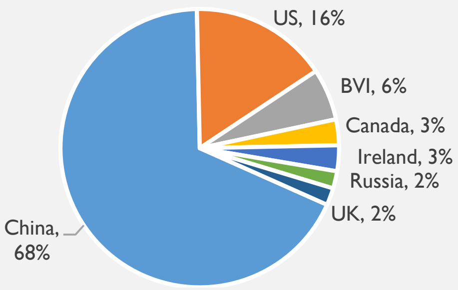
A practical real-world example would be automated insurance payments for flight delay, which is currently being developed by an insurance company AXA.

There are countless of other breakthroughs and opportunities that could be facilitated by blockchain technology. We have seen many large corporations, even governments, to start their own blockchain projects.

For instance, IBM has partnered with Maersk to develop a blockchain system for supply management in the shipping industry, HSBC has recently announced that the company is ready to test its trade finance transaction using blockchain technology, and Dubai plans to become the first blockchain-powered government in the world.

By nature, blockchain will be most disruptive for the financial industry as the technology could replace

Blockchain Patents Granted in 2017



68% of blockchain patents granted in 2017 were from China. Also, Alibaba holds the highest number of blockchain patents (49) compared to other companies worldwide.

Source: Technode, IPR Daily, incoPat, Schulte Research

many functions of banks. However, the disruption comes in both ways.

There will be increased competition and pressure on pricing, but on the other hand, banks can implement blockchain in their system to improve efficiency and create many new revenue opportunities.

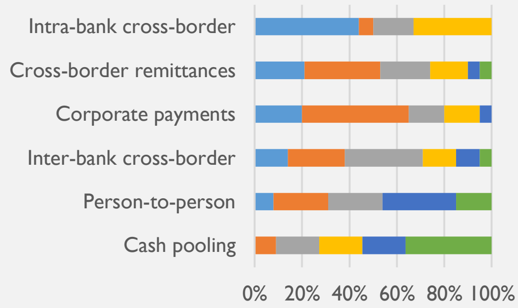
For instance, Reisebank and ATB financial have successfully tested the world's first overseas remittance using Ripple (blockchain-based technology), as early as June 2016.

This technology allows overseas money transfer to be settled in seconds (compared to several days using the commonly used SWIFT network). In addition, exchange of customer information (for validation purposes) is automated, and banks' ledgers will be automatically updated for this transaction.

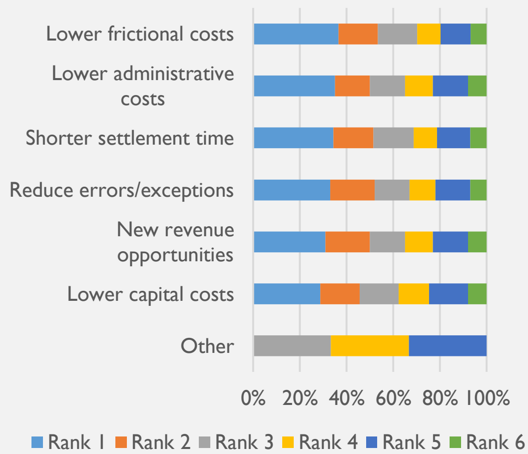
Based on a survey by Accenture, intra-bank cross-border transaction is the most use cases for blockchain being explored by banks. Majority of banks are still in POC and strategy formulation stage of blockchain adoption, and the top 2 reasons for resistance of blockchain implementation are regulatory and compliance related.

Considering the potential disruption, it is not surprising to see that "nine in 10 executives said their bank is currently exploring the use of blockchain", according to Accenture.

Leading use cases for blockchain being explored



Major anticipated blockchain benefits



Source: Accenture

Also, IBM survey shows that 66% of banks plan to have implemented blockchain for their commercial products by 2020.

Undoubtedly, we think that blockchain will become a mainstream just like the internet in the '90s. Essentially, the blockchain revolution will disrupt many businesses, but at the same time, it will bring new opportunities.

#2: The world in a fast train: the end of the physical store as we know it?

Retail is one of the few sectors that has been changing very rapidly since the arrival of the e-commerce era. At first, online challengers disrupted the offline retailers, who scramble to keep up and adapt, often by setting up half-baked online presence.

Then, in a very interesting twist, e-commerce firms that have grown very big start to acquire retail chain and develop their own brick & mortar. Along the way, offline retailers innovate to compete with e-commerce firms through O2O apps.

This leads us to think deeper about the role of offline retailers in shaping up the future of the retail industry.

Offline presence is valuable if you are a big retail chain with strong brand and footprints

Again, we prefer to take our cue from the Chinese market. As discussed in our previous quarterly report, China has been leading in O2O convergence.

Other than through acquisition, e-commerce players are also conducting experiments in brick & mortar by opening advanced supermarket versions. They claim productivity per sqm is significantly higher than the usual supermarket format.

Alibaba and JD.com are also actively converting mom & pop stores into their flagship stores. This partnership is a win-win solution for both Alibaba and JD.com and store owners, because the store owners could skip the middlemen and Alibaba or JD.com will generate more sales.

As we mentioned in our report in 3Q 2017, many ecosystems start to develop their offline presence by acquiring retail chains that have massive footprints. Since our last report, there are at least another eight acquisitions done by both Alibaba and Tencent.

The investment made in the offline presence by the major e-commerce and tech players is a testament to the importance of brick and mortar existence. Obviously, retailers who have big footprint are especially valuable to the tech ecosystem. As it can be utilised as delivery and pick up point.

In Indonesia, the M&A in the retail industry is yet to come. We believe it will start to happen once e-commerce starts to take away more share from the offline retailers. By then, the offline retailers will be forced to find a way to survive.

Offline retailers with big footprints and those who are less vulnerable to digital disruption, such as minimart and big F&B chain, will be in an attractive candidate for O2O collaboration. As such, at the right price, they can make a good candidate to be included in our portfolio.

In US$ billion

Alibaba	5 Feb'18	Leads acquisition of 13% stake in Wanda Cinema	Cinema operator	1.2
	11 Feb'18	Acquired 15% stake in Beijing Easyhome	Home Improvement Retailer	0.9
	20 Nov'17	Acquired 36.2% stake in Sun Art	Supermarket operator	2.9
	20 Feb'17	Acquired 18% stake in Lianhua Supermarket	Supermarket operator	0.1
	9 Jan'17	Increase stake to 74% in Intime	Department store	2.6
Tencent	25 Feb'18	Lead acquisition of 6% stake in Better Life Commercial	Supermarket operator	0.1
	31 Jan'18	Lead acquisition of 10% stake in Heilan home	Menswear retailers	1.6
	29 Jan'18	lead acquisition of 14% stake in Wanda commercial	Shopping mall	5.4
	12 Jan'18	Signed an agreement to invest in Carrefour China	Supermarket operator	N/A
	12 Dec'17	Acquired 5% stake in Yonghui	Supermarket operator	0.6

Numerous acquisition done by Alibaba and Tencent since 2017
Source: Heyokha

All major Chinese e-commerce firms develop their own brick & mortar presence

Alibaba Group
阿里巴巴集团

JD.COM

唯品会
vip.com

Not only through acquisition, have the online guys also developed their own brick & mortar.
Source: Alizila, Retaildetail.eu, Vhteam.Com

Alibaba and JD.com partnership with mom & pop convenience stores

Chinese mom & pop store could convert their store to Alibaba or JD.com franchise. By doing so, they could skip the middlemen/distributor & agents and buying from Alibaba and JD.com at a competitive price.
Source: Alizila

Supermarkets going online, but eventually many of them gave up

Some of them have given up on their own platform and prefer to work with pure online guys
Source: Nielsen

The next question is: what about the smaller scale retailers or mom & pop shops?

O2O apps are the lifeline for smaller scale retailers/mom & pop shops

We believe O2O apps will be the key beneficiaries as they are able to provide the offline guys with an online channel instead of building their own which could be very costly.

Especially for smaller scale retailers/mom & pop shops who have limited resources, O2O app is the only choice for them to grow. Not to mention, there are many big retailers that failed to build their own online channel.

As such, online food and grocery delivery companies in China have been enjoying explosive growth, one of them is Meituan-Dianping. These companies facilitate both restaurants and retail stores in providing an online presence and instant delivery services.

Ele.me, Meituan-Dianping, and Baidu Waimai drivers taking food delivery order (left). Even big retail chain such as Carrefour are happy to work with them in providing grocery shopping delivery within an hour (right).
Source: Caixinglobal, CLSA China Reality Research

Moreover, merchants can focus on improving their products instead of having to divert their attention to build an online presence.

Chinese version of Craigslist – 58.com home, an O2O app providing informal workers access to online channel
Source: Technode

Little wonder that Meituan-Dianping, the leading lifestyle O2O services in China, became the fourth most valuable startup in the world with US$ 30bn valuation, based on the latest October 2017 fund-raising. The company is reportedly preparing itself for US$60bn IPO sometime this year.

Another example of an app that helps mom & pop shops to go online is Shopify. This Canadian-based SaaS (software as a service) platform provides a very simple and cheap way for everyone to open an online shop.

Merchants only need to pay as low as US$ 29/month to be able to sell their product on their own website and social media. It is almost a no-brainer compared to building in-house IT team and e-commerce platform.

As a result, Shopify's revenue has grown by more than 3x in two years and more than 600,000 merchants worldwide are using Shopify. We will discuss more about Shopify in our next report as we believe they will play an important role in this space.

In Indonesia, we already started to see some O2O services growing rapidly, such as Go-Jek. As we mentioned in our 3Q 2017 report, Go-Jek is becoming the first true Indonesian tech ecosystem.

Now, it has more than 15 verticals that provide all kind of services, including the largest e-wallet in the country based on both monthly active users and transaction value.

Source: Heyokha

All of these verticals are the equivalent to Didi/Uber + Meituan-Dianping + 58.com home + WeChat Pay.

We believe these O2O apps will continue to thrive on the back of offline guys becoming more receptive towards technology. The type of services and market size is enormous.

#3: The world in a fast train: Is precious metal still relevant as a store of value during the era of blockchain and digital gold (cryptocurrency)?

During 2017, the most popular cryptocurrency, Bitcoin, has its price increased from US$963 to US$13,850 (+1,338%). This makes the 21% increase of MSCI World Index in the same period seemed minuscule. No wonder cryptocurrencies are popular.

Cryptocurrency is a digital asset initially designed to be a medium of exchange. It uses cryptography to provide secure transfer of funds and operates independently of a central bank, made possible using the distributed ledger system of the blockchain technology.

Unfortunately, cryptocurrencies are now being perceived more as an investment asset, not what it was created for. Despite criticisms of crypto as a fraud and a way to launder money, it is very difficult for the financial establishment to ignore the surge of crypto.

The mammoth US$1.2bn initial coin offering by the encrypted messaging service Telegram has been pouring more fuel on the fire. Telegram plans to build a virtual economy where its 170mn users "can provide the critical mass to push cryptocurrencies towards widespread adoption".

"I'll give you a HUGE bonus in bitcoins if you can explain to me what the hell they are."

CartoonStock.com

As written in FT's Lex Column 26 Jan 2018, cryptos are in danger of becoming respectable, as there would be validation for cryptos in Telegram backing from prominent PE investors.

One big relevant question for investors is whether, in the era of cryptocurrencies, precious metal still has a place as part of an investment portfolio.

Clearly, cryptocurrencies are much easier to transact, store, and divide. It is often referred to as "*Digital Gold*". However, in the section below, we discussed why in our view precious metal should remain an essential part of an investment portfolio.

According to a Bloomberg report, the biggest platform to buy and sell digital currency in Indonesia may soon have more members than then the country's century-old stock exchange.

Indonesia Digital Asset Exchange, formerly known as Bitcoin.co.id will have 1.5mn members buying and selling digital currencies such as bitcoin, ethereum, and ripple by the end of this year. The platform only started in 2014 and currently has 1.14mn investors. The platform sees almost 3,000 new members signing up every day.

As a comparison, the Indonesian Stock Exchange with the Jakarta index around an all-time high, has only 1.18mn registered participants. And this is after many years of heavy campaign by the stock exchange to invest in the nation's stock market.

Another question for precious metal is whether it makes sense to allocate some capital to this asset class, given we are currently at the onset of quantitative tightening.

Heyokha's view on precious metal in the era of crypto and quantitative tightening

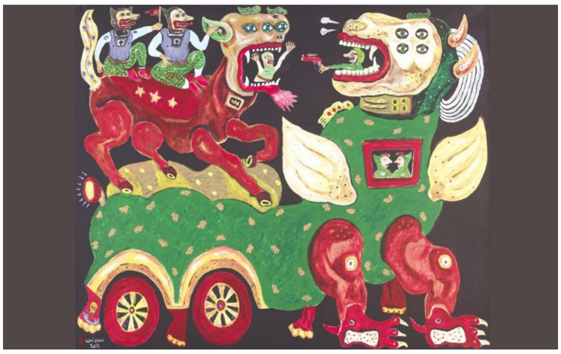
In our 1Q 2016 report, we wrote that our main calls revolve around three major interactive themes, being: anger, disruption, and inflation.

• **Anger**: we believe the cause of the people's anger about unfairness is the unintended consequence of central bank policies that increase the divide between the rich and poor.

• **Disruption**: we believe that the disrupting effects of innovation are accelerating the divide between winner and losers, resulting in (initially) increased deflationary pressure leading to more money printing and even bigger wealth divide.

• **Inflation**: while consensus was calling for deflation, we see deflation will very soon be leading into a new era of inflation.

We believe these three above are the *Zeitgeist*, the spirit of our time.



[Click here for our 1Q 2016 report]

Crypto-currencies have understandable appeal to millennials who came of age during the 2008 GFC. Being digital natives, many are fully accustomed to owning digital assets that have no concrete properties.

Exorbitant housing costs and the perception of disappearing jobs for human have blocked the traditional paths to upper-middle-class status.

Debt overhang is simply monumental. According to data from the Institute of International Finance (IIF), global debt level hits US$233 trillion in 3Q 2017. With the world population of 7.6bn, we work out that the world's debt per capita is at US$30,657.9. The amount is simply staggering.

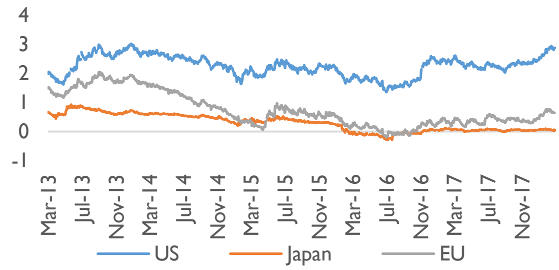
No wonder that the millennials are angry and many of them want to back up decentralised crypto-currencies as a form of protest against a centralised fiat-currency system.

"Treasure the people, then the land, and the ruler least of all"

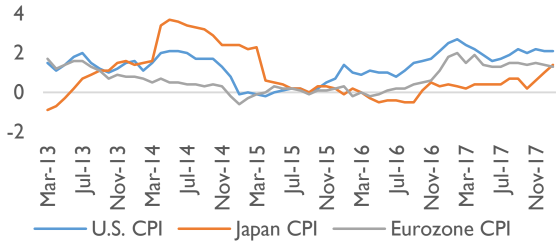
-Meng Ke, Chinese philosopher-

CPI is picking up, fueled by rising oil and coal prices. Stronger global economy and China's supply-side reform are adding fuel to the fire?

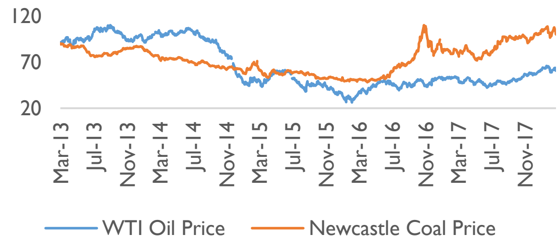
10-year US, Japan, and Europe government bond yield, %



US, Japan, and Europe consumer price index year-on-year



Oil and coal price



Source: Bloomberg


U.S. EDITION
SIGN IN
Newsweek

WEED AND BITCOIN ARE LURING MILLENNIALS TO WALL STREET

BY RYAN SIT ON 1/29/18 AT 12:15 PM

Source: Newsweek

As discussed previously, blockchain technology that underpins cryptocurrencies represents even a bigger disruption than many other technologies. It could automate many functions and significantly reduce the need for human employees. Essentially, blockchain technology will improve efficiency, but at a cost of reducing employment. Just like what robots did in manufacturing.

With the blockchain based cryptocurrency grabbing the headlines recently, it is natural to discuss whether cryptocurrency still has a place in our portfolio.

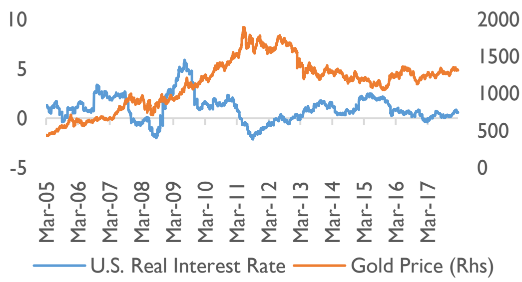
Is digital gold (Cryptocurrency) a better inflation hedge than real gold?

In our 1Q 2016 report, we wrote that we are about to enter the era of rising inflation. Global interest rates have been kept far too low for an extended period since the global financial crisis in 2009.

Now the situation seems to be turning around; bond yield in developed countries has started to rise from their extremely low level in mid-2016, indicating rising inflation expectation.

US dollar index has been weak since the contrarian Economist cover in Dec'16 continues its slide

Real Interest rates remain low, as rising bond yields is defied by increasing inflation



Source: Bloomberg

China, that for years had been an exporter of deflation, is now turning into exporting inflation. China's Feb 2018 CPI figure, at 2.9% growth YoY, has sent Chinese real interest rate decisively into negative territory.

The gap between deposit rate and CPI increase was -1.40%. This represented the lowest level in over six years. With PBOC behind the curve, along with most central banks, real rates are likely to stay below zero for this year.

As the outlook moving more and more towards inflation, the need for inflation hedge is rising. Below, we discuss whether "digital gold" (cryptocurrency) can replace traditional gold as an inflation hedge. To begin with, to be a good inflation hedge, we believe that it is paramount that an asset class should have limited supply.

There is no supply limit on crypto-currencies

For cryptocurrencies, supply for each is determined by the code made by the developer when it was initially created; some have limited supply (i.e. Bitcoin) and some don't (i.e. Ether). However, the problem is that there is an unlimited amount of new cryptos that can be made.

Currently, there are more than 1,000 types of cryptocurrencies and the number keeps on increasing as crypto popularity soars. Among these many coins, Bitcoin is currently one of the most popular as it is one of the earliest crypto-currency that gained real exposure and traction, despite its limitations.

However, there is still no clear winner on which cryptocurrency will be the one widely adopted. When a new and better cryptocurrency is created, demand for the older ones (including Bitcoin) could disappear. We think that this remains the biggest risk of cryptocurrencies.

Gold has a finite supply

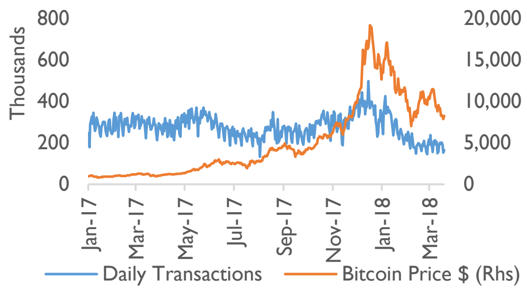
In contrary to cryptocurrencies, the supply of gold cannot be easily increased, and mining costs will also continue to rise with inflation. More importantly, gold is a precious metal with many desirable criteria that can't be replaced by other metals or any other atomic structure in the known universe; it has no direct substitute.

Hence, in terms of limited supply, we think that the case for gold is strong. (Please refer to the Alchemy of Gold in Appendix II on page 27).

Demand for a cryptocurrency might not sustain

There is no doubt that the rising cryptocurrency prices were driven by strong demand. However, cryptocurrencies were initially created for transaction purposes. Taking bitcoin as a proxy, its value keeps on increasing outpacing the number of confirmed transactions using Bitcoin.

Bitcoin price and the number of transaction



Source: Bitcoin.com

This is one signal showing that Bitcoin price might not be sustainable. The reality is that Bitcoin still has high transaction fees, long processing time, and very volatile price, making it unreliable for daily transactions.

Due to these limitations, there is a risk of Bitcoin (and possibly other cryptocurrencies) losing its demand when a new and more efficient crypto-currency is made. When this happens, the price may fall.

Demand for gold has been around for thousands of years and likely to stay

We think that demand for gold is more likely to stay resilient. History suggests that gold has been widely used as a store of value for thousands of years. It is also considered a safe haven asset, where investors put their money on during the period of political or economic instability. In most cases, it has been proven that gold price sustained during stock market downturns.

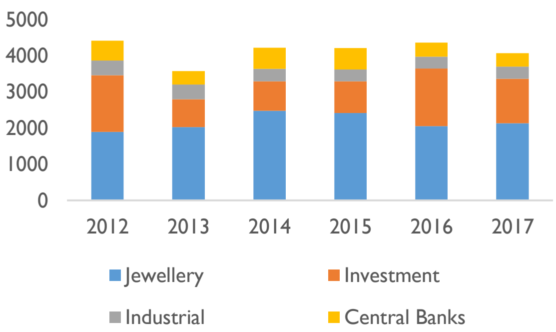
Period	S&P 500	Gold
21 Sep 1976 - 6 Mar 1978	-20%	54%
28 Nov 1980 - 12 Aug 1982	-27%	-46%
25 Aug 1987 - 4 Dec 2987	-34%	6%
16 Jul 1990 - 11 Oct 1990	-20%	7%
17 Jul 1998 - 31 Aug 1998	-19%	-5%
27 Mar 2000 - 9 Oct 2002	-49%	12%
9 Oct 2007 - 9 Mar 2009	-57%	26%
10 May 2011 - 3 Oct 2011	-19%	9%

Gold price increased during most cases of stock market crashes
Source: Goldsilver.com

The percentage of IPOs with negative earnings has climbed to a 17-year high, reaching a level just before the dot-com crash in 2000. A warning sign?
Source: WallStreetJournal, Topdown Charts, Jay R. Ritter

Gold is widely used as a reserve for central banks; around 20% of gold ever mined is currently held by central banks. It is widely accepted as a store of value. Gold can be viewed as a global currency that can't be easily printed like fiat currency.

Gold demand in tonnes



Source: Thomson Reuters GFMS, LBMA, World Gold Council

In addition, gold also has a wide range of physical uses that helps to retain its demand. Currently, the majority of gold is used for jewellery as it has many suitable characteristics unreplaceable by other metals.

Gold has a very strong traditional value that will not easily disappear. Moreover, gold also has many industrial uses, ranging from conductors to medical uses.

Key Advantages

Gold	Cryptocurrencies
Has physical use	Easier to store, transact, and divide
Has long history as a store of value	Decentralised and private
Less correlation with stock markets	Lower transaction cost
Unregulated	Unregulated
Less volatile price	
Not prone to hacking	
No substitute	

Source: Heyokha

At this moment, we like gold as an inflation hedge and insurance against uncertainty in the global economy

For cryptocurrencies, most of its advantages are for transactional purposes. We think that it is a better medium of exchange compared to gold. However, as an investment vehicle, there is a huge risk in terms of demand sustainability as it can be substituted by new cryptocurrencies.

Unless there is one widely adopted digital currency (which we think is less likely to happen anytime soon), gold should be a preferred option, in our view.

Gold was a global currency before the era of fiat currency and has managed to retain its function as a store of value. We think this is unlikely to change anytime soon. Supply is limited, making gold a good hedge against inflation and insurance on political and global economic uncertainty.

We subscribe to the view that the central bankers globally won't be able to trim their balance sheet gently. There will be plenty of bumps along the way and the central bankers may even have to reverse the balance sheet contraction in the future.

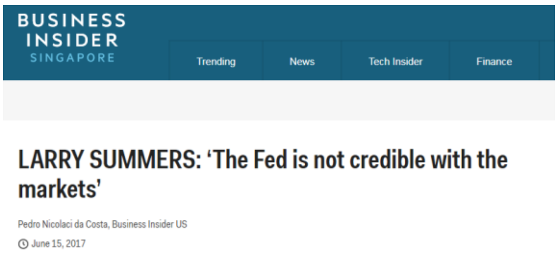
In addition, there are several other concerns that we think can be insured by having exposure in gold:

I) The risk of central banks losing their credibility

Gold is a good insurance against the decreasing credibility of the central bankers. The Fed is case in point. One of the Fed's strategies to lower long-term interest rates is by convincing the market that they will keep short-term rates low. This strategy works, but only for as long as the market trusts the Fed.

As a result, many think that the Fed is sometimes pressured to make interest rate decisions based on its previous statements with less regard to unemployment and inflation data. There are also conflicting statements from different Fed officials, causing the Fed to slowly lose its credibility.

On the other hand, gold is not governed by a central bank, making it a good insurance.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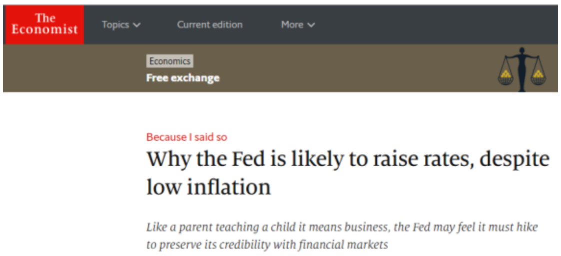
LARRY SUMMERS: 'The Fed is not credible with the markets'

Pedro Nicolaci da Costa, Business Insider US

June 15, 2017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Because I said so

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Like a parent teaching a child it means business, the Fed may feel it must hike to preserve its credibility with financial markets

II) Concern on trade war

The Trump administration has recently imposed protectionism policy by withdrawing from Trans-Pacific Partnership and hiking import tariffs, amongst others. This risks a global trade war as others are fighting back. Already, the European Union responded by threatening to impose 25% tariff on U.S. motorcycles, jeans, and bourbon. China also warned that it has prepared for a trade war. Worryingly, this is just the beginning and there is no certainty on what's going to happen next. A trade war will result in slower global economic growth, potentially creating a downturn in the stock market that are currently priced at high growth assumptions. As a safe haven asset, gold is a good hedge for this risk.

III) Potential currency war

The U.S. Dollar index has retraced from its peak in December 2016 by 12%. It was partly fuelled by Trump administration's weak dollar policy, including the U.S. tax cut that is projected to decrease federal revenue by $1.5tn over the next decade, widening U.S. fiscal deficit, and depreciating the U.S. Dollar.

The Trump administration prefers weaker greenback; Mr Trump said that the U.S. Dollar is "getting too strong" (April 2017) and U.S. Treasury Secretary Steven Mnuchin commented that "a weaker dollar is good for us as it relates to trade and opportunities" (January 2018).

In response, the EU has recently accused the U.S. of deliberately devaluing its currency. Although we haven't seen any actions from ECB yet, there is a risk that currency war might happen. Again, Gold will be the winner in a currency war as it cannot fight back.

Source: Courtesy of Merk Investments

Overall, we think that there are many uncertainties in the global economy and political issues that can be well insured by gold. In the next section, we discuss gold miners as a leveraged play on the gold price.

The case for gold miners

Gold miners have operating leverage that makes it more sensitive to changes in gold price, especially for companies with leveraged capital structure. Gold miner stocks can be seen as a leveraged play on the gold price.

Despite gold having the biggest influence on its valuation, there are many other factors that affect stock prices of gold miners such as labour cost, equipment cost, fuel, regulation, and many others.

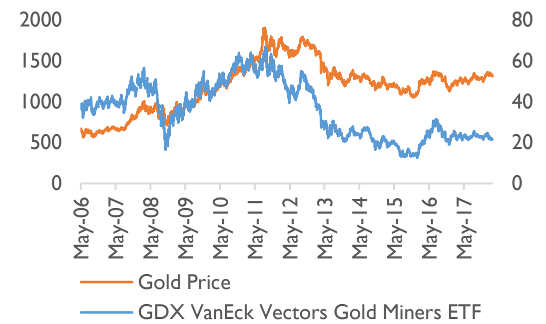
Some miners also have its selling price hedged, removing its correlation against actual gold price movement. Gold mining stocks' performance is also heavily influenced by the company's management and corporate actions.

The new money flooding into gold mining sector during the active merger and acquisition season (in 2011-2012) will naturally go to the gold miners with large deposits.

The challenge is that these deposits could be in a very challenging location, in the sense that they are unlikely to ever be economical due to their low grades, problematic metallurgy, or social issues.

During its peak in 2011, the gold price was at $1,900/oz and the consensus was for the price of the yellow metal to go even higher. This incentivises miners to do more M&A deals.

Gold price vs. gold miners stock price



Gold mining stock index represented by GDX ETF has underperformed the return on actual gold (XAU/USD) by a large margin since 2012.

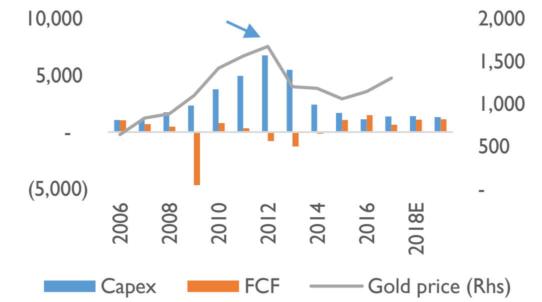
Source: Bloomberg

Even with aggressive gold price assumptions, valuation of gold miners could expand to as high as 2x NPV, compared to less than 1x NPV today. By the time gold price corrected, many companies were stuck with high leverage, amplifying the punishing effect to their stock prices.

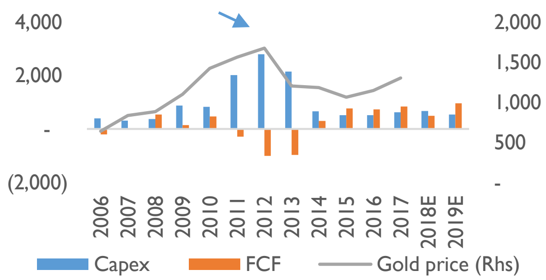
Taking two of the major gold miners as a proxy (Barrick and Newcrest), there is a high correlation between gold price and capex in the past (see below). Highest capex was spent when the gold price was at its peak; acquiring precious metal assets at aggressive prices.

This discipline helps them to produce healthy free cash flows

Barrick's capex vs. FCF (US$ million)



Newcrest's capex vs. FCF (US$ million)



Source: Bloomberg

Adding leverage to the cocktail, the result was significant losses from declining gold price during 2012-2015. Many of the newly acquired gold mine projects became unfeasible. Until early 2016, gold miners were amongst the most hated sector in the investment world.

The situation has changed, albeit slowly. Now, discipline has returned amongst these gold miners. Capex spending is still kept at a healthy level without evidence of over-investment despite the rebound of gold price since early 2016. The lesson from the previous painful years is still well remembered. Bull market climbs a wall of worry.

Case in point is Barrick Gold, previously notable for its reckless acquisitions during the gold price rally. Now the company has learned its lesson.

In February 2018, John Thornton, Barrick Gold's executive chairman, stated that the company passed on several deal opportunities last year; "We simply will not yield to pressure to 'just find something' in order to 'grow'," said John Thornton, Barrick Gold's executive chairman.

He added that in mining, history shows that when times are good, mining companies overpay for "mediocre assets and invest in projects with low returns". "At Barrick, this will not happen".

The balance sheet of the top ten members of the GDX gold miners index verifies the story above. From the period of 2012 to 2017, gold miners' balance sheet has managed to deleverage despite 32.9% equity erosion, after multiple years of asset impairment.

Net gearing actually decreased from 0.17x in 2012 to 0.15x in 2017. The key is that net debt fell by 40.2% during the period, bigger than the fall in equity.

They generated positive free cash flow when the average gold price was $1,259 in 2017. This is in contrast with the negative free cash flow when the average gold price was $1,669 in 2012. We believe that this represents a better capex discipline.

Top 10 members - GDX	2012	2017
Net debt (US$ mn)	17,914	10,709
Net gearing	0.17x	0.15x
FCF (US$ mn)	**(3,018)**	**3,179**
Average gold price	**1,669**	**1,259**

GDX top 10 members are: Newmont Mining, Barrick Gold, Franco Nevada, Newcrest Mining, Goldcorp, Wheaton Precious Metals, Agnico Eagle Mines, Randgold Resources, Royal Gold, and Kinross Gold
Source: Bloomberg

Since bottoming in December 2015 at US$1,051, the gold price has been climbing back up. We believe that the risk-reward justifies owning gold miners as the performance of gold mining stocks still significantly lags the gold price.

Gold mining stocks are currently trading at late-2008 level. Back then, the gold price was at US$730/oz, compared to currently at US$1,330/oz.

Overall, we see the advantage of owning gold miners as a way to express our view on rising global inflation and a weaker USD, and more importantly to hedge our investments in the era of anger and disruption.

"Never, never, never believe any war will be smooth and easy, or that anyone who embarks on the strange voyage can measure the tides and hurricanes he will encounter. The statesman who yields to war fever must realise that once the signal is given, he is no longer the master of policy but the slave of unforeseeable and uncontrollable events."

-Winston Churchill-

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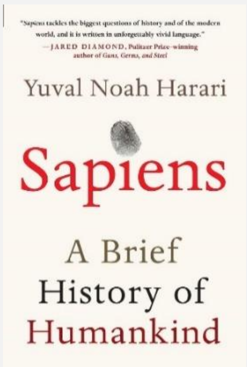
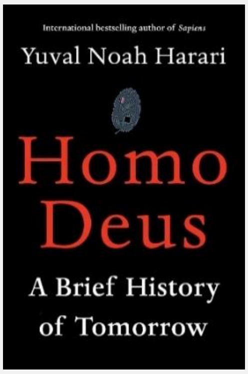
-The End-

------------- Appendix I -------------

The endgame: the era of superhumans or data religion?

Heyokha team recently read *Homo Deus: A Brief History of Tomorrow* by *Yuval Noah Harari*. The book is the sequel to his previous epic book *Sapiens* (we discussed Sapiens in [our 3Q2015 report]).





In *Homo Deus*, Harari points out that more people die today from eating too much than from eating too little. In 2014 more than 2.1 billion people were overweight, compared to 850 million who suffered from malnutrition. Half of humankind is expected to be overweight by 2030.

Also, more people die from old age than from infectious diseases; and more people commit suicide than are killed by soldiers, terrorists and criminals combined. All these largely thanks to technology and phenomenal economic growth, which provides us with plentiful food, medicine, energy and raw materials.

The trillion dollar question is: if we are indeed bringing famine, plague and war under control, what will replace them at the top of the human agenda? This question is simple, yet urgent and unprecedented thanks to the immense new powers that biotechnology and information technology are providing us with. Harari argues that humanity's next targets are likely to be immortality, happiness and divinity.

Having reduced mortality from starvation, disease and violence, we will now aim to *overcome old age and even death itself*. Having saved people from abject misery, we will now *aim to make them positively happy*. And having raised humanity above the beastly level of survival struggles, we will now *aim to upgrade humans into gods and turn Homo sapiens into Homo Deus*.

Going forward, he predicts that the government will manage a country, but it no longer leads it as it has no idea where the country will be in twenty years. Harari predicts that humanity would bring about one more epochal event to rival the agricultural and scientific revolutions.

More importantly, most humans will not be upgraded, and will consequently become an inferior caste dominated by both computer algorithms and the new superhumans. These superhumans are likely to be the preserve of the techno-elites, as countries may find it more sensible to focus on upgrading a handful of superhumans beyond the norm. The brave new religions, in his view, have everything to do with technology. Eternal life, bliss, and divinity will be the projects of the twenty-first century. Harari thinks that the new techno-religions can be divided into two main types: *techno-humanism* and *data religion*.

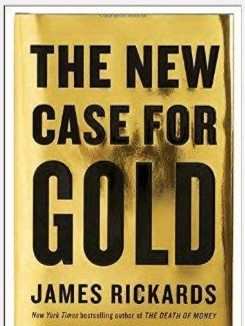
Techno humanism is a more conservative view and still sees humans as the apex of creation and clings to many traditional humanist values. It agrees that Homo sapiens as we know it has run its historical course and will no longer be relevant in the future, but concludes that we should therefore use technology to create Homo Deus – a much superior human model.

These superhumans will enjoy unheard-of abilities and unprecedented creativity, which will allow them to go on making many of the most important decisions in the world. If that sounds terrifying, data religion takes it to the next level by arguing that humans have completed their cosmic task and should now pass the torch on to entirely new kinds of entities.

No wonder that Elon Musk warned about the potential dangers from the rise of AI and called for the creation of a regulatory body to guide the development of AI. He said that AI will threaten all human jobs and that AI could even spark a war. AI is also the biggest risk that we face as a civilisation. Stephen Hawking warned that AI could be the "worst event in the history of our civilisation" unless society finds a way to control its development.

------------- Appendix II -------------

The Alchemy of Gold



Reading *The New Case for Gold*, we came across one very interesting chapter where the author James Rickards discussed a BBC interview with Andrea Sella, a professor of chemistry at University College London.

Prof Sella provided an in-depth review of the periodic table of the elements to explain why gold, among all the atomic structures in the known universe, is uniquely and ideally suited to be money in the physical world.

We can (rather painfully) recall the periodic table of the elements from high school chemistry class. A total of 118 elements are represented, from hydrogen (atomic number 1) to ununoctium (# 118).

Nothing physical in the known universe that is not made of one of these elements or a molecular combination. If we are looking for money, we will find it here.

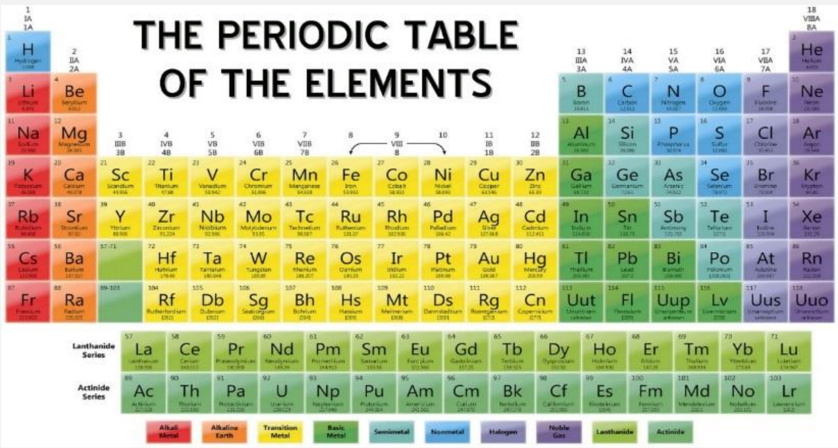
Prof Sella quickly dismissed ten elements on the right-hand side of the table, including helium (He), argon (Ar), and neon (Ne). They are all gases at room temperature and would literally float away. Clearly not good as money.

Elements such as mercury (Hg) and bromine (Br) are liquid at room temperature, so they are all out. Arsenic (As) is rejected for a very obvious reason: because not everyone is convinced that money is poison. Turning to the left-hand side of the periodic table, we get twelve alkaline elements. The problem is that they dissolve or explode on contact with water. Saving money for a rainy day is a good idea, but not if the money dissolves when it rains.

The next elements to be discarded are those of Uranium (U), Plutonium (Pu), and Thorium (Th), for the simple reason that they are radioactive. Also included in this group are thirty radioactive elements made only in labs that decompose moments after they are created.

Most other elements are also unsuitable as money. Iron (Fe), copper (Cu), and lead (Pb) don't make the final cut because they rust or corrode. No one wants money that debases itself, we should leave the debasement business to the central bankers.

Aluminium (Al) is too flimsy and Titanium (Ti) is too hard to smelt. With this process of elimination, there are only eight candidates left for use as money: the noble metals. While all of them are rare, only gold and silver are available in sufficient quantities to make a practical money supply. The rest are too rare.



Thus, only two elements, silver and gold, left. Both are scarce but not impossibly rare. Both also have a relatively low melting point and are therefore easy to turn into coins, ingots, and jewellery. Out of these two, silver reacts with minute amounts of sulphur in the air.

Also, gold (Au) has one final attraction: it's golden. All of the other metals are silvery in colour, except copper which turns green when exposed to air.

------------- Appendix III -------------

President Jokowi and fintech

Presiden Joko Widodo
3 hrs ·

Pada tahun 2013, situs belanja besar di Tiongkok, Alibaba meluncurkan sejenis produk tabungan yang dinamakan Yu'e Bao. Saat itu bank-bank konvensional di sana tenang-tenang saja.

Ternyata, hanya dalam waktu empat tahun saja, Yu'e Bao sudah berkembang pesat mengungguli pesaing-pesaingnya. Di tahun 2017 lalu, Yu'e Bao mengelola dana sekitar USD160 miliar, menjadi produk tabungan terbesar di dunia.

Apa kunci keberhasilan perusahaan milik Jack Ma ini? Pemanfaatan teknologi yang sesuai dengan perkembangan zaman serta integrasi dengan produk lain yang semakin memudahkan. Alibaba memasukkan Yu'e Bao langsung ke dalam aplikasi mobile-nya dan diintegrasikan dengan Alipay, sistem pembayaran Alibaba.

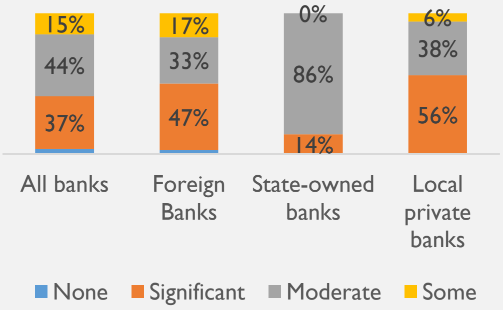
Inilah yang saya ceritakan di hadapan para pimpinan bank nasional di Jakarta, agar mereka berhati-hati dengan fenomena seperti ini: perubahan dan perkembangan teknologi yang begitu cepat. Perbankan Indonesia harus mampu mencari dan menyiapkan inovasi-inovasi terkini yang dapat memajukan dunia perbankan nasional.

Foto: Biro Pers Setpres

It is interesting to note that President Jokowi is fully aware of fintech opportunities. In his Facebook post, he mentioned how Alibaba is not only surpassing banks as a wealth management product distributor, but also turning Yu'ebao to become the biggest money market fund in the world.

President Jokowi urged Indonesian banks to continuously innovate and be aware of how fast the change in technology is.

What is the level of risk of that your bank's business will be disrupted by new FinTech competition in 2017?



Some mixed views about Fintech disruption in 2017. The state-owned banks think the impact will be somewhat moderate compared to local private banks who believe the impact will be significant.

Source: PwC Indonesia banking survey 2017

Talking to some bankers in Jakarta, we sense that there is a wide range of response and opinion on the threat from the fintech barbarians. The challenge is that, even for bankers who are well aware of the fintech threat they pose to incumbents, the options available are often limited.

The banking sector is historically a sector that is very resistant to disruption by technology especially given high customer loyalty. For instance, the average customer lifetime of account bank account holders is around 17 years (vs 12 years in the UK) and there are about 40% young people use the same bank as their parents according to Money Live.

Franchise value of the incumbent financial firms tends to be high as clients tend to stick to established and enduring brands that represent strength and stability.

As such, it is a huge uphill battle to convince bank colleagues, regulators, and stakeholders on the need to embrace a massive change in a short period of time.

On the regulation side, for example, banks are facing many restrictions. Granted that some bankers are using this regulatory challenge as a convenient excuse to avoid changes. But some issues are more genuine than others.

Growth hacking, for example, is much more difficult to do for a conventional financial service company. Their credit rating is their lifeline and regulators won't tolerate losses for a long period of time.

For us at Heyokha, innovation being introduced by Indonesian fintech start-ups and slow response by incumbents represent a gigantic opportunity. In the medium term, we believe that fintech does pose challenges to the financial incumbents for the following reasons:

Firstly, one common argument (for the bank, against fintech) is that bank will not lose its dominance over cheap funding because these e-wallet has no banking license. As such, they still need banks to store the money.

However, the way we see it, banks actually lose something that is even more valuable than cheap funding which is … data. Tech ecosystem will own the data and data is the new oil.

We suspect that as we are moving closer to the era of data as we discuss in the early part of this report, tech companies will possess vastly more superior data as compared to the conventional commercial banks. Eventually, these tech companies could acquire a small bank just to get a banking license just like what Alibaba and Tencent did. It is thus crucial that banks embark on data science and technology.

Secondly, most fintech firms are aiming for unsecured smaller size loan. This is an area whereby some Indonesian banks could charge interest rate as high as 30% APY.

In total, this type of loan makes up about 18% of total bank loan portfolio. Quite chunky. In addition, this segment represents the fastest growth area. Now, with the fintech focusing on this segment, banks will have no choice but to share the pie with the fintech barbarians.

In summary, we are in the camp who believe that the no-ordinary disruption that rocked the likes of ticketing and retail industry is about to shake the financial industry.

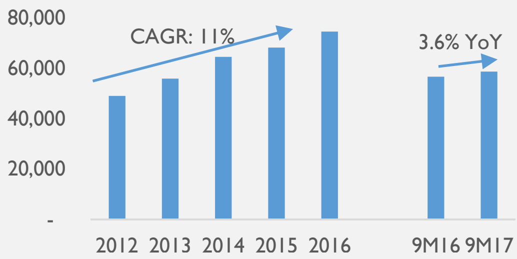
It is true that Indonesia is still a very promising market for the financial services industry as penetration is still very low. The question is whether this opportunity will be captured by the more nimble and aggressive fintech firms or by incumbents.

Indonesia: A slowdown in economy or change in spending pattern?

In Indonesia, the main concern is that business sector has been slowing down substantially despite commodity prices starting to recover. Even Unilever only managed to grow its revenue by a low single digit in 2017, compared to typically mid-teen growth in previous years.

Major consumer staples sales growth slowed

Unilever Indonesia and Indofood CBP sales in billion rupiah



First, nine-month 2017 sales growth was the slowest in the last 10 years

Source: Companies financial report

Weakness is also felt in the retail sector, with department stores and minimarts seeing the slowest SSSG in five years. Some also asked if we are about to see the death of shopping malls and offline retailers in Indonesia, as traffic in some established malls have been declining.

Shops closed down in Tanah Abang garment center (left) and the sad state of once hugely popular Glodok Plaza electronic center (right)

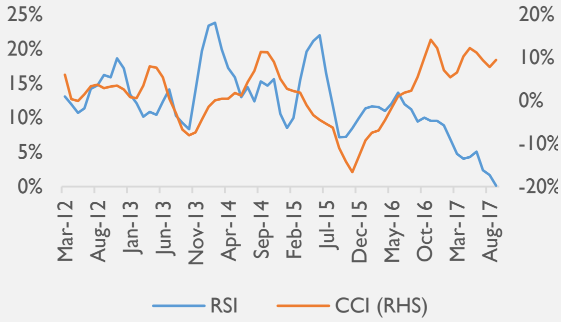
Source: detik.com, Heyokha

What is even more confusing is that Indonesia consumer confidence index was strong, but the retail sales index is trending down. Consumer confidence index comprises of the respondents' current income and jobs availability.

As a result, the correlation should be positive with retail sales index. Retail sales index is a survey based on 270 brick & mortars across the type of items. Based on the methodology, we are quite confident it does not include sales through online channel. Hence, our guess would have to be that people changed the item they bought and the way they spent as they spend more time on their smartphone.

Everybody lies? Indonesia retail sales index deviates from Indonesia consumer index for the 1st time

Change in Indonesia retail sales index and confidence index YoY

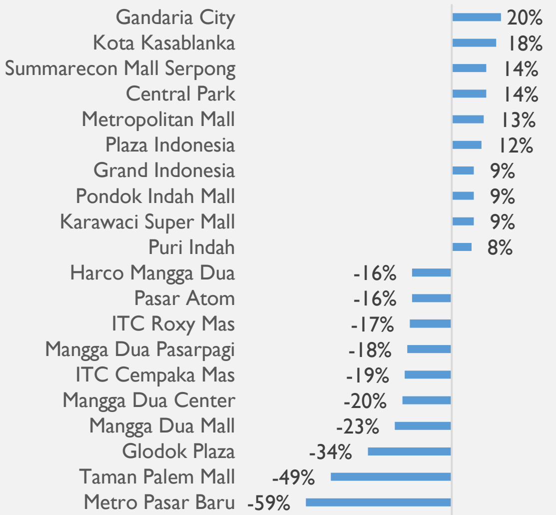


Source: Bank Indonesia

One fine example is that there were discrepancies in visitor growth among different shopping malls. The chart below shows that malls that focus on shopping experience saw the number of visitors declining significantly.

Discrepancies between shopping malls' visitor growth

Change in visitor YoY 2016/2017



Source: Bank Indonesia

Meantime, their peers who have switched to lifestyle were faring much better, still registering healthy growth. Usually, these lifestyle malls provide more F&B spaces for people to hang out with friends.

According to Pakuwon (PWON IJ), one of the biggest mall operator in Indonesia, their F&B sector tenancy portion has been increasing to 20-25% of mall space from only 15% three years ago. Summarecon (SMRA IJ), another big Indonesian mall operator, observes the same trend; tenancy mix increased to 19% from 16% a year before.

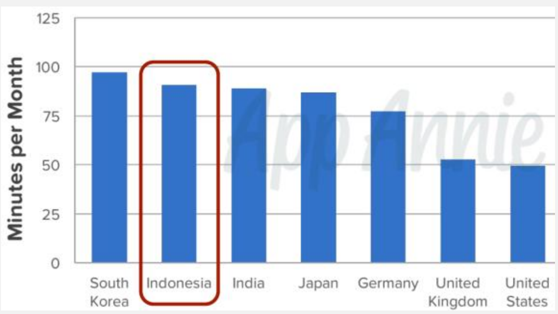
The point here is that not all offline retailers can deal with, borrowing the term from Andy Grove, the 10x change. The typhoon, the tsunami change, that can be the biggest opportunities and threats any business can face. This inflexion point, coming from the era of the not ordinary online disruption, demands a big shift in strategy and capabilities, and constant vigilance.

How an individual offline retailer can step back from the burdens of today and constraints of yesterday, and set aside time to adapt to the future of their business and their industry, is a more strategic question than asking whether the offline store will stay relevant when the train is moving very fast.

The e-commerce train in Indonesia going to be even faster

Indonesia is only second to South Korea

Minutes per month spent on shopping app per person



Average Indonesian spend 80 minutes per month in a shopping app, only second to South Korea which boasts one of the highest online retail penetration in the world

Source: App Annie

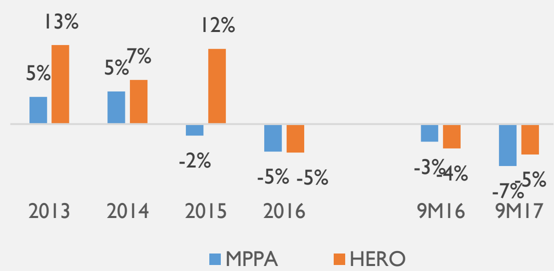
Hootsuite survey shows that the number of Indonesian E-commerce shoppers increased by 155% in 2016 to 25mn people, or about 10% of the population. There is not much data we can get from Indonesian e-commerce companies but if we can see that the revenue of Bukalapak.com (one of the largest marketplace sites in Indonesia) grew by triple digit. They claimed to have US$ 1bn GMV and generated US$ 10mn revenue during the last twelve months.

Also, the 1st ASEAN listed major tech company, Sea Ltd, claimed that their market place subsidiary Shoppe registered GMV growth of 388% during the first 9 months of 2017. Most of this growth, without any shadow of doubt, came from Indonesia. In the same period, Alibaba owned ASEAN and Indonesia-focused e-commerce platform Lazada saw a whopping growth rate of 209%.

On the contrary, Indonesian offline retailers, particularly department stores and large format retailers experienced lacklustre or even negative YoY sales growth in 2017.

Large format retailer also suffer from both e-commerce disruption and minimart

Hypermart (MPPA) and Hero supermarket (HERO) sales growth



Electronics and home appliances (one of the most vulnerable category) accounts a significant portion of their total gross selling space

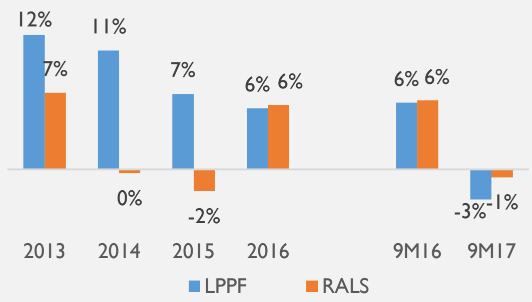
Source: Companies financial report

According to Hootsuite, Indonesia e-commerce transaction in 2016 was around US$ 5.6bn, or about 1.7% of national retail sales. However, if we compare the US$ 5.6bn figure to total sales of Indonesian modern retail association, which is Rp200tn or US$ 15bn, e-commerce transaction was already pretty sizable.

Arguably, e-commerce and modern retailer customers have the most overlapping. (It is important to note that many of the Indonesian retail association members are listed companies, so the implication for the investors in the public market is worth noting).

Indonesian department store SSSG

Ramayana (RALS) and Matahari Dept store (LPPF) SSSG YoY



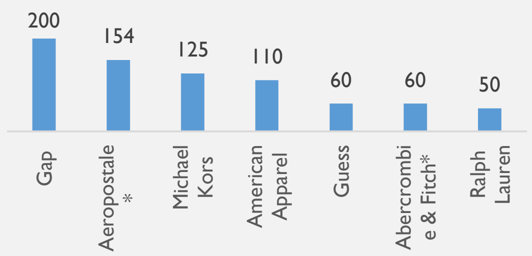
Source: Companies data

As if e-commerce disruption train is not enough as a challenge, department stores also need to deal with the fact that people tend to spend less and less on apparel.

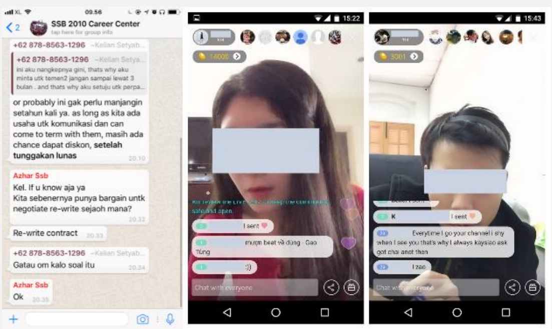
In his eloquent presentation, Spencer Fung, Group CEO of Li & Fung (link), discussed how apparel spending share as a percentage of people's wallet has fallen from above 80% in 1900 to only around low single digit. In his view, this is primarily caused by the millennial generation who prefers to buy something to improve their life, health, performance and wants more interaction with their friends.

Not only dept stores, apparel (specialty) retailers were also impacted

Apparel retailer store closure in 2017 globally



Source: Reuters



Source: Heyokha, Bigo Live

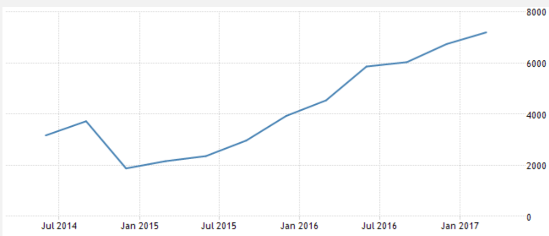
The nature of social interaction itself might have changed. One does not need to dress up to "meet friends" in a WA chat group, for example. Although this may change again with more and more video-based social platform gaining traction. At least, people might need to buy makeup and shirts in the video setting.

How fast infrastructure for e-commerce has been improving

Some argue that e-commerce is still years away from disrupting the retail business, and that the disruption is overhyped. We think, if anything, the disruption process has been understated. The train is getting even faster.

Internet speed has improved by more than 2.5x compare to two years ago

In kilobyte per second



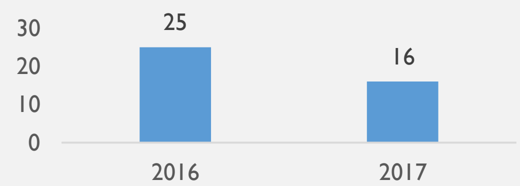
Source: Tradingeconomics

Another common argument against tech is that the massive growth registered by tech companies is not going to last forever. They argued that when the subsidies are reduced, growth might fall off the cliff.

The chart below, however, suggests otherwise. Naturally, growth should be slower due to higher base effect. However, the overall growth rate is still very robust, as discussed earlier.

Subsidies have been scaled down yet the GMV growth remains resilient

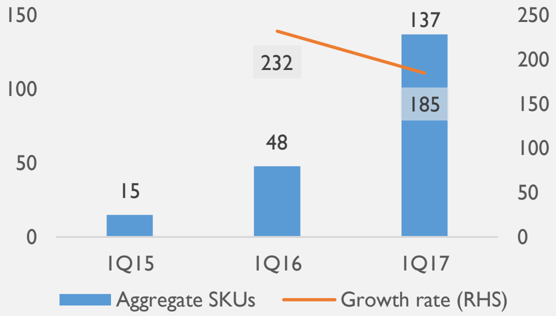
Average online price discounts vs. the same offline SKU, %



Source: CLSA, Lazada Indonesia

Another interesting data point that shows how far the e-commerce industry in Indonesia has come of age is the number of aggregate SKUs carried by the leading Indonesian e-commerce companies. At 137mn, it has grown by almost 10x compared to two years ago.

Aggregate SKUs – leading Indonesian e-commerce companies



Source: CLSA, Company interviews

In addition, the speed of delivery has improved markedly, especially outside Jakarta. This was largely helped by the huge infrastructure build-up delivered by the current government. We believe the speed will continue to accelerate going forward as e-commerce players are aggressively investing in building warehouses.

Average delivery times

	2015	2017
Jakarta	2 days 21 hours	2 days 13 hours
Surabaya	5 days 10 hours	3 days 3 hours
Medan	6 days 8 hours	3 days 23 hours
Overall	**4 days 20 hours**	**3 days 5 hours**

Source: Euromonitor, ITU, CLSA

With the recent billions of dollars capital injection from Chinese tech giants, Indonesian e-commerce sector is certainly in a much better position, both operationally (with the technical assistance from the Chinese tech firms) and financially.

With the e-commerce bullet train, the often-told story of consumers shifting from traditional to modern retailers may need to be edited. It is quite likely for a consumer to leapfrog directly from traditional retailer to e-commerce. We have seen this scenario happened before in China and we have many reasons to believe that it won't be any different here in Indonesia.