

Investment Opportunity of Financial Technology

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I. INTRODUCTION

FinTech is a new term combining finance and technology. The term did not exist until the end of 2014. Although there is agreement over what finance is, there is no agreed upon definition of technology. It changes with time. American sociologist Read Bain wrote in 1937 that technology includes all tools, machines, utensils, weapons, instruments, housing, clothing, communicating devices, and transporting devices and the skills by which we produce and use them. Scientist Ursula Franklin [1992] gave a different definition in 1989 and referred to technology as a “practice, the way we do things around here.” Rather than referring to the objects that people produce and use, scientists and engineers usually prefer to define technology as applied science. Still, there are other views, such as French philosopher Bernard Stiegler’s (1988) definition of technology as “the pursuit of life by means other than life” and as “organized inorganic matter.”

In general, *technology* can be defined as a collection of techniques. Sometimes, it is more broadly defined as the entities, both material and immaterial, virtual or augmented, created by the application of human effort to achieve some value. It is this last definition that makes the “tech” in *FinTech*, or *TechFin*, interesting.

Financial technology is not new. A narrower definition is new processes, products, applications, or business models in the financial services industry, composed of complementary financial services and provided as an end-to-end process via the Internet. However, some recent observations may indicate that *FinTech*, while consisting of the words financial and technology, has a much broader meaning.

Successful financial institutions have never been short of capital, or new technology. Financial innovation is the winning formula for successful incumbents. Perhaps it is good to understand why technology, once a beloved friend, is now a feared disruptor. There is the enormous profit margin squeeze as the forces of disruption continue their rampage. Incumbents have ruled the turf with modern technology and a colossal capital base for many years. What is preventing them from innovating as they did before? How different is the “new *FinTech*” from the traditional financial technology that was once the weapon of regulatory arbitrage and an enabler of efficiency improvement within the organization?

FinTech, in this heavily regulated and high cost environment, can perhaps be redefined as an activity that forms or changes the culture for the benefit of life as it is known. It is therefore inconceivable to conjecture that the best and most valuable form of *FinTech* cannot be achieved by technology or capital alone. *FinTech* has enhanced the ability to innovate freely, to collaborate, and to serve low profit margin customers. The focus should be on serving the entire pyramid of customers and completing the financial ecosystem.

It is even more interesting to observe that the successful *FinTech* companies are closely linked to serving the underserved segments of the economy, such as microfinance and microinsurance. These companies are serving many supposedly insignificant customers closely related to financial inclusion. *Inclusive FinTech* can be defined as an efficient combination of finance, technology, and inclusion by using *FinTech* to reach out to the unbanked and underserved.

II. THE STRATEGY OF UNBUNDLING AND REBUNDLING

Individual emerging companies and start-ups do not usually disrupt all the services of the incumbents at once. A single start-up will tackle a specific vertical and exert profit margin pressure on the incumbents. However, a group of disruptors acting together is like a school of piranhas that inflict many wounds on their victims. As each of these

companies or start-ups is tackling a different vertical, it is unbundling the single monolithic banking institutions. Start-ups such as Wealth front and Betterment will disrupt the wealth management services of banks; business loan companies like Prosper and Lending Club will disrupt lending services; digital banking apps like Moven and Digit will disrupt banking services; and much more. Unbundling allows customers, particularly millennials, to have a choice of services, resembling ordering from an a la carte menu from different providers. Customers may move away from a single bank that provides all services that serve the majority of their financial needs and toward hand picking the specialized services of various providers with specialized services. Of course, some banks, such as Santander Bank, have been trying to unbundle themselves.

These FinTech start-ups allow customers to take control of every individualized aspect of their finances and remove the friction of engaging in financial transactions. With a smart phone and new technology, the barrier to entry has been lowered for newcomers. Start-ups are attracting funds from venture capitalists and reinventing finance for (1) providing banking without fees, (2) mobile payments and money transfer with low fees, (3) wealth management using robo-advisors with a fraction of the fees, (4) business loans with shorter duration, (5) lower fees and interest, (6) merchant and insurance services with better user experience, and (7) free software to ensure timely payroll management. In summary, these companies allow increased access to data and information; reduce friction for transactions, and lower cost and fees for the consumers.

In the first wave of FinTech disruption, these start-ups unbundled the banks. Now that the economies of scale have set in, with a large number of customers on the start-ups' platform or app, FinTech companies are rebundling the services. There are many examples, but notable ones are peer-to-peer (P2P) lending company Zopa, which applied for a full banking license so that it can offer saving products; remittance company Transfer-wise, which is launching cross-border bank accounts; and Alipay, which offers a whole range of banking services and beyond. These companies often rely on using banking services to bring their products and services to market. The significant threat to the incumbents is when these disruptors can parlay their success in their core service into other categories of financial or nonfinancial products.

Key to the success of these FinTech companies has been the use of open application programming interfaces (APIs). These APIs can be viewed as a set of rules that computer programs can follow to communicate with each other. Open APIs allow third-party access and development, thus resulting in crowd sourcing wisdom and talents. These open API platforms connect, curate, and control new services. In the process, data are collected for further innovation, such as providing credit rating, online and off line, and location-based services. Smart licensed banks are open to collaboration; notable examples are Mondo Bank, Solaris Bank, Number26 (integrated with Transfer Wise), BBVA, Fidor Bank, Atom Bank, Web Bank, BRI, BCA, Mandiri Bank and Cross River Bank.

Another important factor has been the ability to leverage on their inherent advantages as digital native enterprises with flexibility, agility, and speed, with greater allure for talented developers that are conversant with the latest technologies. Successful examples are companies that have a workforce with low average age, a laissez-faire working environment, and operate with a new kind of business model in a market that is friendly to innovation.

III. LASIC: SOME COMMON CHARACTERISTICS

Lee and Teo (2015) identified some common factors that are crucial for successful FinTech companies. The LASIC principles define five important attributes of business models that can successfully harness financial technology to achieve sustainability. Most of these companies have the underlying objective of creating a sustainable social business for financial inclusion and impact investment. The five attributes that compose the acronym are (1) Low margin, (2) Asset light, (3) Scalable, (4) Innovative, and (5) ease of Compliance.

Low Profit Margin

Information and services are readily available for free on the Internet, and users have low willingness to pay for service providers of any kind. Over an extended period, the margin will appear low.

Asset Light

Businesses that can ride on existing infrastructure will not incur high expenditure on fixed assets. These businesses can scale without incurring considerable fixed costs on assets. Many of the successful FinTech companies take advantage of the existing infrastructure of e-commerce platforms or telecom facilities.

Scalability

Successful FinTech businesses are expandable without exponential cost. The ability to harness technology for large-scale

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changes is a critical success factor.

Innovative

Successful FinTech businesses also need to be innovative both in their products and operations. Most of these companies are disruptive but inclusive, tapping into technology to solve real world problems and issues.

Ease of Compliance

Businesses that are not subject to a high compliance regime will be able to be more innovative and have lower capital requirements. Successful enterprises operate in an environment that is little regulated, and their activities have a high likelihood of government support.

IV. THE DOMINANCE OF CHINESE FINTECH COMPANIES

It is interesting to note that the LASIC FinTech or Internet Finance companies from China are dominating the world. Out of the world's top 10 FinTech companies, 5 are from China. The five Chinese companies are Ant Financial, Qudian, Lufax, ZhongAn, and JD Finance. Three interesting observations can be made:

1. **The market valuation of Ant Financial is larger than some established banks.** For example, Ant Financial has a market capitalization of US\$60 billion and is larger than American Express Bank, Morgan Stanley, PNC Financial, and the Bank of New York.
2. **There is much global interest in Chinese FinTech companies.** In 2016, Ant Financial raised US\$4.5 billion in one of the largest funding rounds for a private Internet company; P2P lending and online wealth management company Lufax raised US\$1.2 billion; online direct sales JD.com subsidiary JD Finance raised US\$1 billion; and Installment e-commerce firm Qudian (known as Qufenqi before this exercise) raised US\$449 million. In September 2017, China's first Internet-only insurer, ZhongAn Online Property and Casualty Insurance Co., Ltd., announced its intention to raise US\$1.5 billion in Hong Kong's biggest ever FinTech initial public offering (IPO). ZhongAn was formed in November 2013 by Alibaba Executive Chairman Jack Ma, Tencent Chairman Pony Ma, and PingAn Insurance Group Co. of China, Ltd. (2,318.HK) Chairman Peter Ma. The appetite for FinTech, especially inclusive FinTech, from the investment community has been enormous, and for good reasons.
3. **Profits of Chinese FinTech companies are growing faster than most global banks.** For example, Ant Financial's revenue jumped 92% to 10.2 billion yuan in 2014 with 2.6 billion in net profit, resulting in a profit margin of 26%. What is more interesting is the expected compounded annual growth rate of 64% from 2015 to 2017. Thus, FinTech companies like Ant Financial have the advantage of economies of scale to further enhance their profits by taking advantage of economies of scope from additional services beyond being a trusted payment agent between buyers and sellers on Alibaba. Similar numbers are seen in other Chinese FinTech companies.

LASIC, LASID AND THE 5Ds

The LASIC principle describes the attributes needed for such technologies to be successful in an economy where services are shared. However, sharing of services will lead to a concentration of wealth and power. With a handful of cash-rich FinTech companies in the world growing more powerful and dominant, some governments are stepping in to slow their growth and aggressive acquisitions around the world. It is likely that these companies will be a victim of their own success, with incumbents exerting pressure on regulators. Some believe that FinTech monopolies are hurting wages and entrepreneurship and could be distorting the political landscape. Some have even argued that this FinTech monopoly power might become, ironically, more concentrated than any in recent history and have expressed concern they will increase income inequality and strangle innovation. How the regulators react will depend on their attitude towards the Gig or Bounty economy. There are signs in China and the United Kingdom that tolerance may have been reached with the disruption that has transpired. Although new business models and jobs are created in these countries, there are fears that these disruptions go beyond just business and alter how society is organized. The advantage of the C in LASIC for some FinTech companies may be disappearing. Businesses that are *decentralized* may eventually be the ones that can grow, and the C in LASIC may have to be replaced by the letter D. Businesses with LASID characteristics

may well be those that use decentralized technologies to avoid the pain point of heavy compliance.

The 5Ds (digitalization, disintermediation, democratization, decentralization, and disappearance) are various stages of FinTech development. Economies and companies will go through cycles of the 5Ds. Digitalization will lead to new business models, and such a digitalization process is crucial for new revenue. Disintermediation will have a significant impact on incumbents, especially those that perform middleman functions such as custodian, stock brokering, and trustee services. The democratization of information, technology, and services will further disrupt the incumbents that have monopolistic profits protected by regulation. Although the first three Ds allow FinTech companies to disrupt the incumbents, decentralization is crucial as regulatory pressures mount. Interest in distributed technologies such as blockchain will increase as resistance to FinTech development gathers momentum. Diminishment and disappearance of legal structure or centralised governance become key to FinTech development regarding cross-border penetration via smart contracts. If compliance is too burdensome for growth and innovation, decentralization will be the natural choice for most FinTech companies. We shall elaborate more on the latter in the following section of how decentralization will allow for a more sustainable and equitable growth.

ICOs AND BLOCKCHAIN

No fewer than 55 hedge funds (Exhibit 1) are investing in blockchain and cryptocurrencies, with many more angel investors and professional venture capitalists having stakes in blockchain companies and initial crypto-token offerings or pre-token sales (Chaparro, 2017). Token sales or initial crypto-token offerings (ICOs) are just blockchain projects that create their own tokens in exchange for top volume cryptocurrencies, such as Bitcoin, Ether, or a few other very liquid cryptocurrencies. Once the token sales are completed, some or all of the cryptocurrencies raised are exchanged for fiat currencies to fund project development and other activities. These tokens have certain rights and entitlements, such as the right to vote, the right to create a new blockchain, the right to execute smart contracts, and other activities on the network. Unlike share and equity, there may not be dividends, entitlement of future cashflow, voting rights, or other privileges associated with the projects, such as those stated in the memorandum and articles of association. Some of these traditional projects may have a company or a nonprofit foundation as the contractor for developing and running the software or acting as a facilitator for off line activities such as governance. The software is a decentralized network.

Exhibit 1. 55 Hedge Funds with Investment in Crypto currency and Block chain Companies

(1) Iconfirmation, (2) Alpha Bit, (3) Alphabet Coin Fund, (4) Auryn Capital, (5) BKCM Digital Asset Fund, (6) Blackmoon Crypto, (7) Bletchley Park Asset Management, (8) BlockAsset, (8) Block View Capital, (9) Blockchain Capital, (10) BlockStack, (11) BlockTower Capital, (12) Blueyard, (13) CoinFund LLC, (14) Coinshares 1 LP/Global Advisors, (15) Crypto Asset Fund, (16) CryptoAssets Fund, (17) Crypto Fund AG, (18) Crypto Lotus, (19) Cryptochain Capital, (20) Cryptocurrency Fund LLP, (21) Cryptor Trust, (22) Cyber Capital, (23) Digital Developers Fund, (24) Ether Capital, (25) Exagon Fund, (26) FBG Capital, (27) Fenbushi, (28) Firstchain Capital, (29) General Crypto, (30) Grasshopper Capital, (31) Hyperchain Capital, (32) ICONOMI, (33) Iterative Instinct, (34) Kenetic Capital, (35) Logos Fund, (36) Medici Crypto, (37) Metastable, (38) Monkey Capital, (39) Multicoincapital, (40) Pantera, (41) Placeholder Capital, (42) Pollinate Capital, (43) Polychain, (44) Rich Fund, (45) SatoshiFund, (46) Science Inc., (47) Solidus Capital, (48) SorosFund Management, (49) SuperBloom, (50) TAAS Fund, (51) Tezos, (52) The Token Fund, (53) Token Factory, (54) Unit Fund, (55) Venture One

Source: Business Insider, Chaparro [2017], and author.

Crypto currencies, on the other hand, are decentralized networks that usually create new coins at intervals. At times, these crypto currencies may have a limited supply or a preissued supply that require no mining. Although some may have a foundation backing them, others are just open-source software with known or unknown creators behind them. There may be bugs or new ideas that the community will wish to discuss and implement. A core group of developers with other developers will then issue and circulate to a mailing list the improvement proposals (IPs). Once accepted, they will usually be published in github, but having an IP does not make a formally accepted standard until its status becomes final or active. In the case of Bitcoin, they have standard track, informational, and process Bitcoin improvement proposals (BIPs).

- **Standard track BIPs:** changes to the network protocol, block, or transaction validation or anything affecting interoperability.
- **Informational BIPs:** design issues, general guidelines; this type of BIP is not for proposing new features and does not represent community consensus.
- **Process BIPs:** describe or propose a change in the process; similar to standard tracking BIPs but apply outside the Bitcoin protocol.

There were 199 BIPs as of October 2017. Ethereum, another blockchain network, has what is known as Ethereum improvement proposals (EIPs) and Ethereum request for comments (ERCs). One of the most significant token standards for Ethereum is called ERC-20, which was developed at the end of 2015 after the initial standards in early 2015. ERC-20 defines a common list of rules for all Ethereum tokens to follow. ERC-20 is significant because many ICO tokens are created using it. ERC-20-compatible tokens, which may be partially compliant with the ERC-20 rules, have also been created. This is a significant development even though it is not yet a standard. (Once accepted, it will be known as ESD2- Spec.) The ERC-20 compliant token is a catalyst for the rise of ICOs. Many ICOs have created their tokens using ERC-20; the three largest are OmiseGo (US\$1.2 billion market capitalization at middle of September 2017), Qtum (US\$1.05 billion), and TenXPay (US\$431 million). Two reached the status of unicorns in middle of September 2017. The creation of new interim tokens, which will be replaced by the actual tokens when the network is ready, has led to instant liquidity for investors. Token sales exceeded US\$1.8 billion, and total market capitalization of circulating supply was US\$10.08 billion at the end of August 2017, according to coinmarketcap.com. Cryptocurrencies had a higher circulating supply of US\$176.4 billion at the end of August 2017. Although US\$276.48 billion in total for cryptocurrency and tokens in circulation seems huge, it is small in comparison with the market value of gold (US\$1.5 trillion), NASDAQ (US\$6.8 trillion), and global stock markets (US\$66.8 trillion) and is around the size of the Philippine stock exchange and half the size of the Singapore stock exchange.

Given the meteoric rise, many investors are searching for an avenue to gain exposure to the sector while being mindful of the risk involved. Some are rushing in, but others are of the view that the current “bubble” resembles the dotcom bubble in the early 2000s. Regulatory risk is high, but complexity associated with secure storage of the private keys is an even higher risk. Security in storing these crypto assets using the private key and a cold wallet is not easy to understand or to implement for most fund managers, who are used to third-party custodians. As yet, no insurance is available for the loss of these crypto assets.

Investing in a cryptocurrency or crypto-token is different from investing in stocks and shares. Each cryptocurrency or crypto-token serves a different purpose. Bitcoin is a programmable money with partial anonymity. Ether is the crypto-token for the Ethereum network, which functions like a decentralized supercomputer consisting of many virtual machines that power and execute smart contracts and decentralized apps. Trading can be done on centralized and decentralized exchanges, with different prices traded on these exchanges for the same cryptocurrency and crypto-token.

The blockchain is the underlying technology for many of these cryptocurrencies and crypto-tokens. Investors' portfolios' exposure to blockchain technology can be via other means, such as buying into blockchain start-ups. Traditional venture capital (VC) and angel investors will invest in these companies via shares, options, debts, simple agreement for future equity, and other instruments. However, investment into blockchain companies via this route may have liquidity risk and need a longer time horizon for the exit at IPOs.

V. SMART CONTRACT AND FRACTIONAL OWNERSHIP

Smart contracts were first proposed by Szabo (1996): New institutions, and new ways to formalize the

relationships that make up these institutions, are now made possible by the digital revolution. I call these new contracts “smart”, because they are far more functional than their inanimate paper-based ancestors. No use of artificial intelligence is implied. A smart contract is a set of promises, specified in digital form, including protocols within which the parties perform on these promises.

With smart contracts, any kind of contractual clauses may be made partially or entirely self-executing, self-enforcing, or both. The aim is to reduce other transaction costs associated with contracting, and the cryptocurrency community has been using the concept to transact without an intermediary. The most prominent smart contract implementation is the Ethereum blockchain platform, where they are known as a decentralized application. Smart contracts will allow for the P2P transfer of value and digital assets, thus bypassing the control of any centralized authority. This will allow frictionless cross-border and global matching of orders without any trusted third party between and among untrusted parties.

The main advantage of decentralized digital asset ownership is the high divisibility and traceability of cryptocurrencies and tokens. Although it is uneconomical to own an asset worth US\$0.01, this can easily be done in the ownership of digital assets because the digit can go as low as 10^{-8} in terms of units. This micro ownership can go lower if more precision is imposed on the computing network. Decentralized fractional ownership of assets may lead to a more equitable and sustainable financial world with growth.

VI. FINTECH OPPORTUNITIES: FINANCIAL INCLUSION TECHNOLOGY AND ASSOCIATION OF SOUTHEAST ASIAN NATIONS (ASEAN)

Amid all the euphoria of FinTech disruption, many examples and case studies have been left unnoticed. While the world has focused on the success of Ant Financial in China and M-PESA in Africa (Lee and Teo, 2015) in their successful ventures into financial inclusion and sustainable business, there are still more examples in one of the fastest growing areas in the world, that is, the 10 countries of the Association of Southeast Asian Nations (ASEAN) region (Exhibit 2). The low bank account penetration signals business opportunities for FinTech companies in ASEAN with a huge population of over 600 million.

Exhibit 2. Account at a Formal ASEAN Financial Institution (% age 15+)

Country	Female (%)	Male (%)	GNP per Capita, PPP Current International (US\$ '000)
Singapore	98	98	78
Thailand	73	73	12.3
Malaysia	63	69	20.6
Laos	26	27	3.8
Philippines	34	19	6.8
Vietnam	19	24	4.5
Indonesia	19	20	8.2
Cambodia	4	4	2.5
Myanmar	2	4	2.2

It is important to note that a partnership between the government and the private sector is the fastest and most efficient route to scale FinTech services for financial inclusion. Governments can play a critical role in promoting access to electronic payments and closing the gap between access and usage, thus reducing the compliance and operation costs of FinTech companies. The targeted groups are

1. Unbanked poor: the group of populations with little access to formal banking;
2. Traditional remitters: the group dependent on remittances;
3. Mobile users: the group of users with perceived need for smart phones;
4. Migrant workers and poor: the group that works away from home.

It is interesting to note that FinTech companies are already taking advantage of the policy and programs in these countries to provide migrants with microfinance, remittances, and mobile banking services. Many FinTech

companies are benefitting from the programs of the governments: (1) payments: dramatically increasing the supply and availability of electronic payments; (2) savings: providing low cost, a shorter term, and a lower amount of short-term savings with more saving options; (3) credit: improving quantity, terms, and risk profile of agricultural credit with the option of unsecured credit; (4) insurance: growing insurance products to mitigate the risks of the underserved and providing products that collateralize livestock and farming products. All of these initiatives involved the convergence of technology of FinTech with the Internet of Things, big data, cloud computing, augmented reality/virtual reality, blockchain, and other new technologies. It is also interesting to note that QR code, near-field communication, and credit card technologies are all playing an important part in creating new business models and new jobs. Notable successful examples that have gone under the radar of many international observers are SMART money in the Philippines, which offers an electronic wallet that enables bill payment, reload of airtime, and money transfer using a SMART mobile phone. In fact, SMART Communications launched SMART Money in partnership with Banco de Oro in 2001, long before M-PESA. Back in 2004, Globe Telecom had already launched GCash, also an SMS-based offering. Mobile point of sale (mPOS) enables small merchants, such as those in Vietnam's Ben Thanh market and other micro businesses on the move, to accept payment cards for insurance services. Singapore Trans Infotech Pte., Ltd., a subsidiary of Wirecard AG Group, cooperated with Vietnam Export Import Commercial Joint Stock Bank (Eximbank) in the field of mobile payment via innovative mPOS terminals in 2015. In Cambodia, WING is an SMS business established by ANZ to create mobile payments since 2009. In Indonesia, Bank Mandiri e-cash, Telkom's T Cash, XL Axiata's XL Tunai, and Indosat's Dompotku are all investing billions of U.S. dollars into enhancing telecom and computing power. On the global scene, many organizations, such as the United Nations Capital Development Fund, the Consultative Group to Assist the Poor of the World Bank, the Global Impact Investment Network, and the Alliance for Financial Inclusion have all played a significant role in pushing for technology for financial inclusion. The Alliance for Financial Inclusion initiated the Maya Declaration in 2011 and the Sasana Accord in 2013 for its members to turn commitments into actions. However, given that most of the ASEAN countries have few legacy issues and regulatory baggage, they can leapfrog and perhaps overtake the more advanced financial centers like Singapore, Malaysia, and Thailand in the same ASEAN grouping. ASEAN, with digital finance, is a combination of sustainable growth by inclusion for aspiring global FinTech companies.

VII. REVIEW OF PREVIOUS STUDIES

The scope of FinTech is extensive, but we have chosen a few articles that will give a broad view what is to come. Hopefully, these five articles will generate discussions about the future of FinTech in alternative investment.

The first article is by Lee, Guo, and Wang and entitled "Cryptocurrency: A New Investment Opportunity?" It discusses the potential of cryptocurrency and token as a new asset class that exhibits low or negative correlation or association with the traditional benchmark. Although there is evidence to suggest that cryptocurrencies and token assets are good diversifiers, the relatively high returns may be an indication of a market driven mostly by sentiments. At this stage, it is unclear whether there is a bubble or if we fail to see the potential of this new technology. It may be too early to draw any firm conclusion, especially regarding the high risk of converting cryptocurrency into fiat currency and the availability of a friendly and convenient way of storing these digital assets safely for institutions. Until a way is found for managers to be comfortable in dealing with this new found asset class, which may be troublesome to regulate, cryptocurrency may remain an investment opportunity for those with a more adventurous appetite and those with spare cash to venture into the frontier of innovation. The second article, by Shulte and Liu and entitled "FinTech Is Merging with IoT and AI to Challenge Finance: How Entrenched Interest Can Prepare," focuses on the consequences of convergence of technology, the emergence of data-driven business models, and how they affect the investment world. In particular, technology such as artificial intelligence and the Internet of Things may change the way investors look at business decisions, risk, and credit analysis. In a new economy that is driven by computing power and data analytics, investment decisions are likely to focus on valuation metrics that are different from those with which we are familiar. Given that businesses are relying heavily on computing power and residing in the cloud, rather than using humans and real estate as essential production factors, asset allocations in the future may have to change drastically with more weight on businesses that have greater computing power, better analytical infrastructure, and the ability to raise enough capital for scaling to disrupt.

The third article, by Liew and Mayster and entitled "Forecasting ETFs with Machine Learning Algorithms," gives an overview of how supervised learning classification algorithms can enhance the

performance of fund managers. It gives an excellent overview of how statistical techniques have evolved with better computing power that machines can learn on their own with artificial intelligence. It is perhaps not the results that are of the most interest to readers but the demonstration of what three advanced machine learning algorithms can do. Deep neural networks, random forest, and support vector machine algorithms are used to build and test models for the prediction of asset price direction for several well-known and highly liquid exchange-traded funds with holdout cross-validation. It will be interesting to learn whether a combination of human and machine learning AI algorithms will eventually disrupt the fund management industry.

The fourth article, by Koh and Phoon and entitled “Robo-Advisors and Wealth Management,” surveys the robo-advisor landscape and concludes that, despite the lower fees and the superiority of man and machine and bionic power over traditional wealth managers, the authors expect that traditional wealth managers will respond by providing new and improved customized and integrated services at competitive fees. This conclusion has implications for managers that are seeking diversification into any asset class with lower fees and cost-efficient technology. Wealth management services can disrupt premium money management services and democratize wealth management services to serve the underserved. Viewed in this light, a robo-advisor may eventually be seen as an impact investment. This again has implications for asset allocation managers regarding the weight allocated to financial inclusion, which may prove to be an asset class that is under owned and has a low comovement with current traditional portfolios.

The final article, by Ben, Luo, and Lv and entitled “What Starts the Prairie Fire? An Analysis of Marketplace Lending in China: The Status and Driving Forces,” gives an overview of the development and trends of one of the most exciting developments of China’s Internet finance market: market lending, or P2P or peer-to-business (P2B) borrowing. The class of alternative investments focusing on financial inclusion products is attractive to those who wish to take advantage of big data analytics and market inefficiency. New credit rating methods were devised by Ant Financial using big data from consumers and merchants. Investors can take advantage of market inefficiencies, such as regulatory arbitrage, with little regulation in the sector, as well as financial institutions failing to serve unbanked and underserved individuals and micro, small, and medium enterprises. Lack of regulation has led to a significant number of failures in the sector. However, those that survived have transformed the P2P sectors with a lending portfolio that is at least five times greater than the rest of the world’s combined. With the use of technology, many new jobs and business models were created with consumer finance and supply-chain finance. Some larger organizations, such as Lufax, Ant Financial, and CreditEase, have transformed their services into P2P and P2B wealth management platforms. These institutions were able to use the latest technology, such as facial recognition, AI, and blockchain, to serve clients that could never have been served before under traditional finance. It is worth a closer look for alternative managers wishing to diversify into an asset class with a variety of products that complements traditional finance. China has shown the way to balance innovation with the stability of the financial system. A new investment class has emerged to disrupt not only the traditional financial institutions but also to provide alternatives to managers seeking products that have exposure to the entire pyramid. As always, the regulatory risk will remain high in these products. Nevertheless, this class of assets offers some fresh perspective to those seeking returns from new FinTech innovation.

VIII. CONCLUSION

There are six reasons why blockchain may be attractive to investors. First, the crypto asset class has a negative correlation, and it is underowned with low capitalization. Second, blockchain addresses the pain points of impact investment by providing transparency for philanthropy and other funds that seek clarity in donation and the management of funds. Third, ICOs address the pain points of start-ups that are seeking global access to funding. Fourth, ICOs and decentralized exchanges solve the issues of illiquidity of early investment. Fifth, blockchains create a new investable class of assets in areas not previously available through financial inclusion. Sixth, blockchain-based digital assets allow fractional ownership and may solve the pain points of pension funds in meeting their future obligations (Lee et al. 2017). Many other opportunities related to the blockchain, digital finance, and inclusion are also discussed by Lee (2017a, 2017b).

Asset allocation is a task to search for alternative investments that have a low or negative comovement with the existing portfolio and to allocate appropriate weights to all desired investable classes of assets. It has

been known that low or negatively correlated asset classes can turn out to be perfectly correlated during a crisis, especially if these asset classes are over owned. The most important task for an asset allocator is to search for sustainable growth and network effect of an under owned asset class. Given the current scenario, sustainable growth seems to come from those asset classes that have an impact on the social and economic sectors. Financial inclusion and green finance appear to be the areas that provide the most promising returns and protection given their sustainable and under owned status. Coupled with technology that lowers cost and reaches out to those who have not been served and those who are underserved (which constitute a significant number with high growth potential, especially in ASEAN) with little debt, FinTech offers a viable alternative investment and great opportunities to asset allocators. Furthermore, block chain shows promise in addressing the efficiency of collaboration among untrusted parties, solving one of the most critical pain points of financial organizations that are organized in silos. Without the efficiency of collaboration, production will not be at its more efficient points.

It has taken a long time for the financial sector to understand the capabilities of the block chain; it has taken an even longer time for the blockchain industry to understand the importance of the power of being inclusive. Judging by the media coverage and some governments' reactions to crypto currency and ICOs, the learning curve for regulators and investors alike will be steeper than many expect. If the FinTech community moves in the right direction of financial inclusion and green energy with the underlying theme of serving the underserved and unserved, the future of finance will be brighter than most people can perceive.

We hope that this issue will generate some interest in inclusive FinTech, crypto currency, and block chain for alternative investors and asset allocators. The articles in this issue may be too narrow for a more general discussion of where these technologies are leading us especially in regards to decentralized technology. However, we think that this might be a good start for further research to explore the potential of this asset class for diversification. Although some of the discussions may seem alien to seasoned alternative investment managers, it is also an indication that "decentralized" inclusive FinTech is very much an undervalued asset class. That is perhaps the most important message of this special issue on FinTech.

REFERENCES

- [1.] Chaparro, F. "Hedge Funds are Cashing in on Bitcoin Mania—There are 50 Dedicated to Cryptocurrencies." <http://www.businessinsider.sg/bitcoin-price-surge-leads-to-growth-in-hedge-funds-2017-8/?r=US&IR=T>.
- [2.] Franklin, U. *The Real World of Technology*. (CBC Massey lectures series.) Concord, ON: House of Anansi Press Limited. 1992.
- [3.] LEE, D.K.C. *Handbook of Blockchain, Digital Finance and Inclusion, Volume 1: Cryptocurrency, FinTech, Insurtech, and Regulation*. Cambridge, MA: Elsevier, Academic Press, 2017a.
- [4.] — —. *Handbook of Blockchain, Digital Finance and Inclusion, Volume 2: ChinaTech, Mobile Security, and Distributed Ledger*. Cambridge, MA: Elsevier, Academic Press, 2017b.
- [5.] LEE, D.K.C., H. Smorenberg, M. Uitermarkt, and T. Wanders. "The Pursuit of Effective Pension Solutions." *Pensions and Investments*, 2017. <http://www.pionline.com/article/20170626/ONLINE/170629918/the-pursuit-of-effective-pension-solutions>.
- [6.] LEE, D.K.C., and E.G.S. Teo. "Emergence of FinTech and the LASIC Principles." *Journal of Financial Perspectives*, Vol. 3, No. 3 (2015), pp. 24-36.
- [7.] Stiegler, B. *Technics and Time, 1: The Fault of Epimetheus*. Stanford University Press. ISBN 978-0-8047-3041-9. 1998.
- [8.] Szabo, N. "Smart Contracts: Building Blocks for Digital Markets." 1996. http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html.