
Analyzing the impact of FinTech on the Financial Service Industry with respect to its Payment and Settlement Service . A comparative study between Japan and Cameroon.

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Abstract

This paper seeks to investigate the impact FinTech would have on the financial service industry and economic development in Japan and sub Saharan Africa, especially through its payment and settlement services. The results show that the evolution of the payment landscape would continue, displacing the usage of credit cards and adopting the use of crypto-currency, stored in digital wallets. Also, on the settlement platform, clearing houses and intermediary banks would be displaced by a distributed ledger system leveraging on cryptographic protocols, being capable of near real-time settlement, which the transaction costs would be very low. FinTech is greatly innovating and enhancing the efficiency of the financial service industry thereby contributing to economic development. In Africa, FinTech is stimulating Financial inclusion, giving new access to financial services and opportunities to expand businesses such as e-commerce and e-learning which are contributing greatly to economic development. In Japan, FinTech stimulates economies transactions through internet and smartphones including business applications of DLT, thereby contributing to economics developments.

Keywords: FinTech, blockchain, Economic development

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1 Introduction

FinTech is impacting and transforming the financial sector globally. Leading in delivery of financial services, the medium of transactions and the approach to business analysis. It is observed that Mobile payment and digital currencies are enabling faster and more transparent payment and settlement, Online loan applications and more powerful loan analysis accelerating the lending process, Robo-advisors are utilizing machine learning algorithms and data analytics to recommend suitable portfolio to investors at lower management fees. They also have the capability to extend these services to unserved or un-served clients of traditional financial institutions. Crowdfunding is providing new sources of finance for start-ups and riskier businesses unsuitable for public listings, thus enhancing economic growth and development.

2 Review of relevant literature

The term "FinTech" is a contracting of the word's "finance" and "Technology". It refers to the technological start-ups and legacy providers of financial services that are emerging to rival traditional banking and financial players, and they cover an array of financial services [4]. FinTech is an economic industry composed of companies that use technology to make financial systems more efficient (McAuley, 2014). Roy Freedman (2006) describes financial technology as being concerned with building systems to model, value and process financial products such as bonds, stocks, contracts and money. Freedman (2006) also analyses how financial systems which can be viewed as similar to commercial systems are involved with buying and selling of products in different markets at different times through trading systems and trading technology. Trading includes several actions such as auctioning, negotiating, buying, selling, borrowing, leasing, brokering, dealing etc. (Freedman, 2006). According to PwC Global FinTech Survey 2017, many banks customers are now using FinTech services which include Payments, Fund transfer, Personal finance, Personal loans, Traditional deposits/savings accounts, Insurance and Wealth management. As a result, many financial institutions fear losing business to FinTech companies. (PwC, 2017) According to PwC, the Financial Services industry would be unrecognizable in few years as many new innovators in financial services will take over the market. (PwC, 2017). Chrishti Barberis reveals that tech giants have the possibility of becoming non-bank banks (Chrishti Barberis, 2016) In the steady state of Solow growth model, the growth rate of income per person is determined solely by the exogenous rate of technological progress. (N. Gregory Mankiw, 2009) Paul Romer showed how ideas for new goods and services produced by new technologies can be created in the market economy thus fully intergrading technological Innovations into economic growth. (Paul M. Romer, 1986)

3 Key FinTech Technologies Impacting The Financial Service Industry

3.1 Big data and artificial intelligence (AI) technologies.

Big data comprises high volumes of information generated from economic, social, political activities. Artificial intelligence (AI) is the ability for machines to function with human like intelligence programmed into them through certain software and programming languages. Through Machine learning, AI in Machines aids in the use of machines to analyze big data. FinTech greatly leverages on this concept called 'big data analytics'.

3.2 Blockchain technology and crypto-currency

Blockchain technology or distributed ledger technology is literally a database of interconnected ledgers. The ledgers are chained together to guarantee flow and transparency of information within the database.

3.3 Cryptography (smart contracts and biometrics)

Cryptography is act of coding, encrypting, and protecting information from third parties. Quite often, either the message itself or the pipe in which the message flows is encrypted to prevent third parties having access to the information for whatever reason.

3.4 Mobile access internet (APIs and Digital Wallets)

3.4.1 API (application programming interface)

An application programming interface (API) is a specification or instructions intended to be used as an interface by software components like websites and applications to communicate with each other.

3.4.2 Digital wallets

A digital wallet is an online software, or a database, programmed to securely store important information like digital currencies, digital certificates, digital signatures and any information that is required for the owner to trade electronically, against third parties.

3.5 Next generation security (most recent security technologies)

3.5.1 Tokenization

Tokenization is a technology in which a generated random unique number called a token substitute credit card number in a merchant's system meanwhile the actual cardholder data used to authorize the payment transaction is stored in a highly secured server called Vault.

3.5.2 Encryption

Encryption is a technology whereby the cardholder data and/or the transmission path of the data are encrypted or coded to reduce vulnerability of the data and merchant's business risk.

4 FinTech impact on the landscape of payment and settlements services.

4.1 The payment landscape of the financial service industry and FinTech industry

The centralized historical electronic payment system of traditional Financial services industry is coordinated by banks and other financial institutions and is link to bank accounts, debit cards and credit cards from credit cards companies. The Figure 1 shows that electronic transactions rely on a number of intermediaries, which provide acceptance, convenience, and security of transactions. FinTech companies' innovations on the payment landscape include mobile payments, integrated billing, streamlined payments and next generation security. However, most of the innovations do not completely disrupt the traditional electronic payment mechanism but do modify front-end process to improve customer and merchant experience. the first includes consolidating the payment market by use of seamless payments of a single default card. Example of such companies includes Uber and OrderAhead. The second is in fragmentation of the payment market by successful deployment of digital wallets to replace the cards. The cards seen in Figure 2 would be replaced with digital wallets. Example of such products includes Apple Pay, Google wallet, and wallapay. The impact or the interaction between FinTech payments system and the traditional electronic payment system can be grouped into three categories.

- **Open-loop mobile payments solutions:** This model leveraging on NFC (near field communication) and QR code (quick response code) to increase consumer access to the existing payment ecosystem. Examples of companies using this technology include: Apple Pay, Google Wallet, and Masterpass.
- **Closed-loop mobile payment solutions:** This model consolidates the POS (point of sale), acquirer and payment network as a single entity to create a more flexible experience to customers. It allows consumers to fund transactions through the traditional payment network ecosystem like their bank accounts but using the services of FinTech companies. Examples of companies using this technology include: Leaveup PayPal and UBpay.
- **Mobile merchants' payments solutions:** This model integrated payments applications and streamlined payment solutions aims to replace or complement the current POS infrastructure by leveraging mobile connectivity to make payments more effortless and accessible by more merchants. Ex-amples are UberSkip Wallet and Square.

4.2 The settlement landscape of the financial service industry and FinTech Industry

The current value transfer system within the financial and service industry is built on automated clearinghouses and intermediary banks. The actual transfer is not instantaneous as funds may take several hours or even days to move from the sender account to the receiver account. If the sending and the recipient banks do not hold reciprocal accounts, the payment must be sent to a clearinghouse or corresponding bank for the assurance of payment for the recipient, adding cost and delays. Figure 3 illustrates how financial institutions facilitate value transfer today.

1. **Sender Request** Sender asks their financial institutions to transfer an amount to a specific address (using BIC or IBAN codes)
2. **Secure Messaging** Sending bank sends a secure message to the recipient bank requesting transfer of the specified amount.

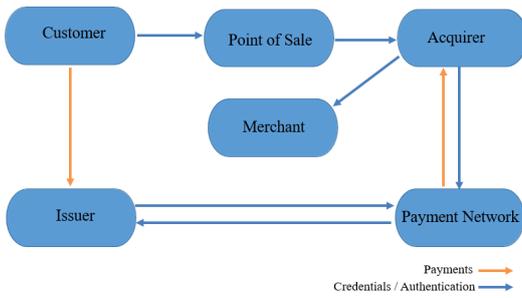


Figure 1: Traditional electronic payment system.

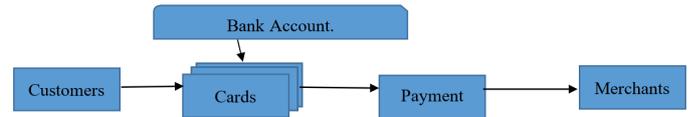


Figure 2: FinTech Electronic payment landscape (Mobile merchants' payments solutions)

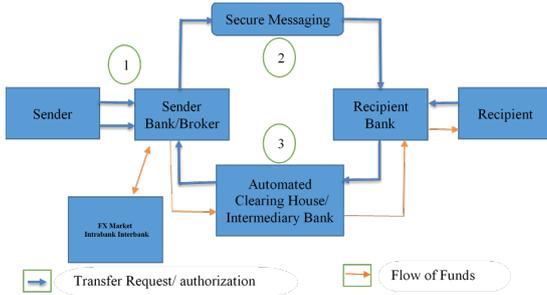


Figure 3: Settlement landscape of the financial service industry.

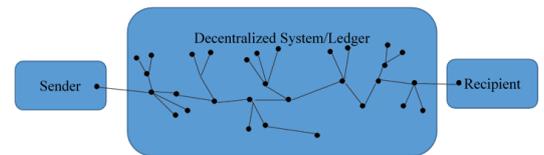


Figure 4: Value transfer system in decentralized payment scheme (The FinTech settlement landscape/system)

3. Flow of Funds The recipient bank responds to the sender bank's request for funds via a clearinghouse or corresponding bank.

On the other hand, the settlement model of FinTech companies would dissolve the role of clearinghouses and intermediary banks by leveraging on the new decentralized payment system. The decentralized payment scheme does leverage on cryptographic protocols to transfer value virtually in a secured, low cost, and near instantaneous manner. Decentralized network utilized a common set of protocols to allocate task across many individual nodes rather than via central points. Most decentralized payment schemes use a single distributed ledger and denominate payment between users in a native "currency", often referred to as a crypto-currency. This system has many advantages in that it is secured by cryptographic protocols, capable of near real-time settlement, very low transaction costs, frequently open source where changes are governed by a network of participants, transparency and traceability of transactions is typically superior to current system. Figure 4 give an Example of a decentralized payment network. It should be noted that there are also mobile money and P2P (peer-to-peer) value transfer networks that rely on a trusted central party to transfer value rapidly across geographies, even in unbanked regions. This too causes an impact in that some of those trusted parties are not traditional financial institutions. A single trusted non-financial third party facilitates value transfer. It relies on intermediary to keep records and settle the transfer. Sender initiates the transfer. (E.g. PayPal, MTN mobile money)

4.3 The evolutionary impacts of FinTech on the payment and settlement landscape.

An evolutionary impact of FinTech on the payment landscape would be made evident by displacement of credit cards as seen in Figure 5. In Figure 5, Credit cards are displaced. We should understand that although credit cards have been around for very long time, they have been very unsecured means of electronic payments proven by the high level of credit card frauds. More to that, merchants and payment solution providers such as mobile wallets pay higher merchant service charge on credit card funded transactions than on bank account funded transactions. To reduce costs, these players will use incentive to encourage customers to switch their funding methods from credit cards to bank accounts. At the same time, merchants will adopt a data driven alternative vendor-financing solution that offer customers lower interest rates and provide financing income to merchants. Credit cards usage will be eroded in payment facilitation and revolving lending. The next stage of the evolutionary Impacts of FinTech on the payment landscape would be the displacement of payment solutions and bank accounts to be replaced by digital mobile wallets of crypto-currency. This will enable customers to pay directly to merchants using crypto-currency. Many more merchants would accept crypto-currency as a medium of exchange and new POS mechanism for mobile wallet to emerge. Figure 6 illustrate the impact on the payment landscape. It is important to note that this system

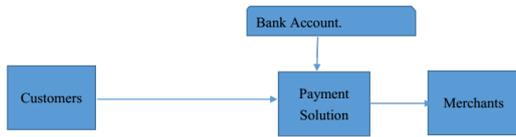


Figure 5: FinTech impacting the payment landscape by displacing credit cards.



Figure 6: Disruptive effect of crypto-currency in the payment landscape

will leverage on Smart devices, NFC and QR code, to instantly transfer crypto-currencies to merchants directly. Crypto-currency value can be peck to local currencies.

5 Data Analysis and Results

5.1 FinTech in Japan.

Taking a detail analysis of all the data and related research questions, its shows that the evolution of FinTech companies in Japan must has been triggered by the evolution in technological developments, changes in consumer’s behavior and global developments of e-commerce and financial services industry. Many articles and interviews including Shigenobu Kobayashi of Rakuten SmartPay and Nao Kitazawa of Money Design Co., Ltd. iterated that. However, despite the evolution of many FinTech companies in Japan, there exist issues they need to redress for a better future of FinTech in Japan. Some of the issues include high level of financial inclusion in Japan. Also, Japan, unlike other major FinTech countries like UK and US, have the culture of using cash against online payments services like credit card. Thus, the consumers still need to develop the culture of using smartphones for financial transactions. (Katsuaki Sato of Metaps Inc.). In addition to that, the laws and regulations in the financial service industry do not fully incorporate FinTech companies and their activities. This makes it difficult for most of them to operate in this new global competitive industry called FinTech in an environment like Japan. FinTech in Japan seems to have greater impact in the followings major areas, payment and settlement, personal finance management (PFM), blockchain, and crypto-currency. However, Japan seems to be making great progress in FinTech. The central bank is thinking the possibility of issuing digital currencies through a distributed ledger technology system. Unlike UK and US, Japanese FinTech companies would be more collaborative than being disruptive. Japan has a culture of teamwork, which seems to be reflecting in the FinTech ecosystem and the financial service industry in Japan. Already, there is an existing collaboration between some Japanese mega banks and some FinTech companies, for example, SMBC Venture Capital and Mitsubishi UFJ Capital are investors in the FinTech Company called Alpaca. (Alpaca, 2017) In addition, Bitflyer (another Japanese FinTech company) has SBI investments, Mizuho Financial groups, Mitsubishi UFJ Capital Co. Ltd, and Sumitomo Mitsui Banking Corporation, in their investors list. (Bitflyer, 2017). Money forward Inc. has Mizuho Financial Group and Mitsubishi UFJ Financial Group as some of their investors. (Money Forward, 2017) However, I think the banks should start revising their business model and actively collaborate with FinTech companies in order to remain profitable in this new wave of evolution. The old business model might no longer be able to satisfy customer’s needs, neither will it be able to fit in a future cashless society.

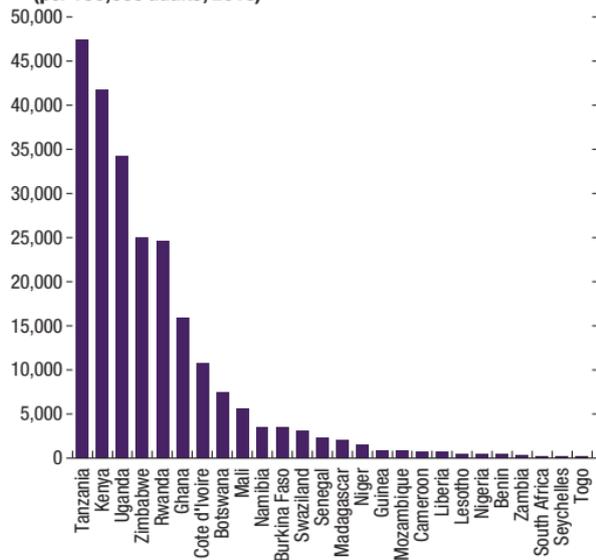
5.2 FinTech in sub Saharan Africa

In Africa, the payment and settlement landscape are greatly impacted by Fintech with the evolution of the mobile payments system also called “mobile Money”. M-Pesa which started in kenya in 2007 now boast of more than 30 million users in more than 10 countries, with other competitors like MTN money and Orange Money, also operation around the continent including Cameroon. There has been an exponential growth of the use of Mobile money within the last 10 years, disrupting money transfer services, payment of Good, services and utilities. This has led the region to emerge a global leader in mobile money Innovations. Mobile money accounts in Africa are quickly out numbering traditional banks accounts, Mobile money is use for various economic activities such as sending remittances, Receive remittance , paid utility bills , receive wages , pay for school fees and receive payments of agricultural products. see figure 7 and figure 8.

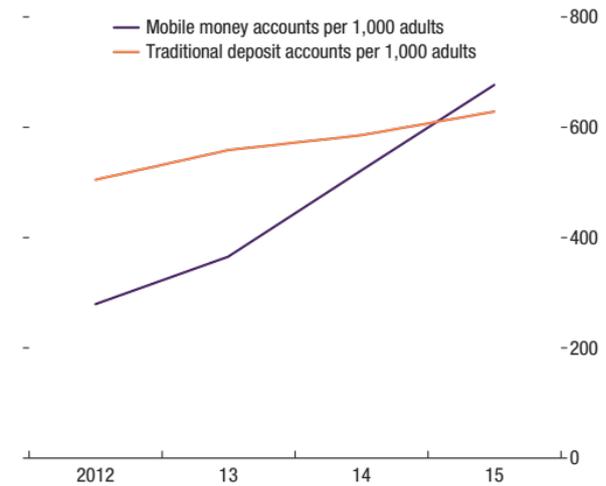
5.3 FinTech and Economic Development.

“The more we think about it the more we realized that technological innovation is almost certainly the key driver of long term economic growth. (Sachs and McArthur).” Innovation is allowing us to do more with less. Innovation in information technology and FinTech enhance the efficiency of financial services and contributes to economic development. In Africa and other developing countries, FinTech has stimulated financial inclusion, enabling people

1. Mobile Money Transactions (per 100,000 adults, 2015)

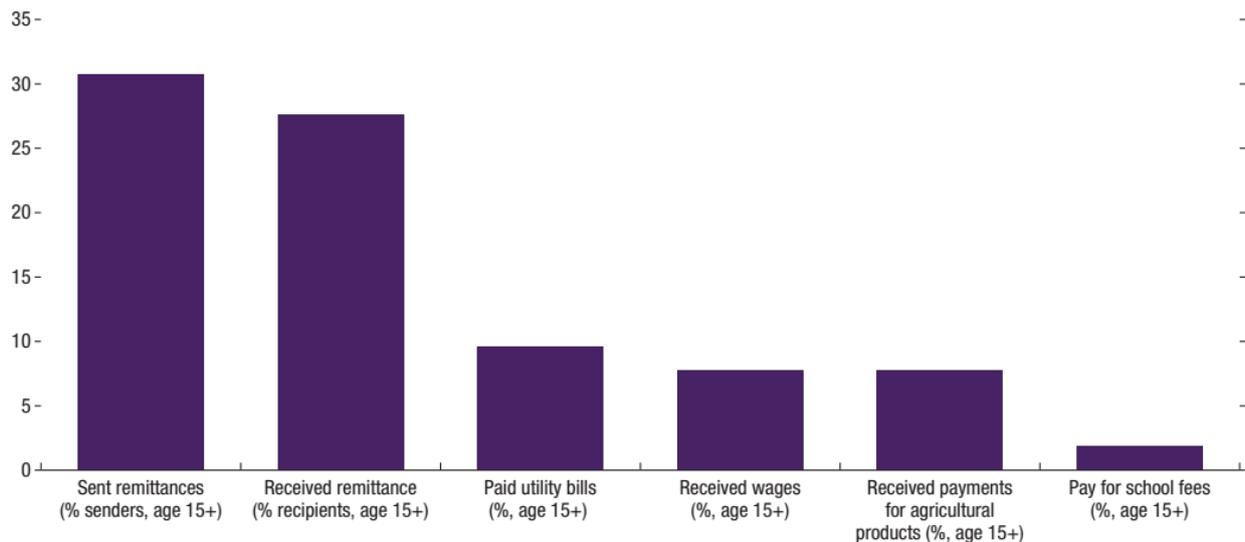


2. Mobile Money versus Traditional Banking



Source: IMF Financial Access Survey.

Figure 7: Mobile Money Development in sub-Saharan Africa



Source: Global Findex.

Figure 8: Uses of Mobile Money in Africa.)

to gain new access to financial services including micro credit, expanding business and contributing to economic developments. In Japan, FinTech is stimulating economics transactions through internet and smartphones as well as business application of distributed ledger technology. Many banks through FinTech are boosting their online banking services and other mobile financial services applications increasing economic growth and development. Generally, FinTech impacts efficiency by decreasing cost and improving the quality of payment and settlement services thus improving economic development.

6 Conclusion

Japan is relatively a cashless society as compare to Sub-Saharan Africa, although it considered a cash base society as compare to US and UK. The high level of Financial inclusion in Japan with ATM machines being flooded all over the country constitute a resistance to the penetration of FinTech payments solutions. However, a good level of success is

being achieved by FinTech payments solutions. In the same light, Mobile money is dominating the payment market in Sub-Saharan Africa, leveraging on low level Financial inclusion with limited banking infrastructure thus making FinTech impact in the region more than that of Japan. Also, cash and credit cards are gradually being replaced by mobile wallets, using cryp-to-currency to settle online and offline bills of goods and services both in Japan and Sub-Saharan Africa. In addition to that, the intermediary role traditional financial institutions play in payment and settlement industry is being replaced by an alternative payment scheme, a decentralized peer to peer network, leveraging on blockchain technology and crypto currency. This much more advance in Japan than Sub Saharan Africa. Finally, The FinTech innovations are positively impacting economic development more in Sub-Saharan Africa than in Japan, by enhancing efficiency, reducing cost and customizing financial services.

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