DEEPENING THE NIGERIAN CAPITAL MARKET WITH TECHNOLOGY: OPPORTUNITIES FOR OPERATORS, REGULATORS AND FINTECHS

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ABSTRACT

Technology is constantly disrupting human activities, posing risks to conventional ways and providing opportunities for new innovations and their proponents. This article explores the state of technology use and opportunities in the Nigerian capital market with the aim of further deepening the market. Analysis of the current practices suggests that technology has supported the operations and regulation of the market although there is room for further improvement, especially with the recent development in the Fintech space. The paper therefore highlights the potential areas of further technological applications and collaborations for capital market operators, the regulator and Fintech companies. These are necessary for a deeper capital market that will adequately compete with some of its global peers in operations and regulation.

Keywords: Exchanges, Fintech, Nigerian Capital Market, Regulators, Technology

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1. INTRODUCTION

Applications of technology to human activities are pervasive and rapidly evolving. Technology is constantly disrupting the way things are done, thereby constituting risk to conventional ways and providing opportunities for new innovations and their proponents.

These have implications for businesses, new innovators and regulators who recognize the need to embrace new technology in order to remain in business. Innovators are seeking appropriate technology to build markets for their products while regulators are also required to understand and effectively regulate new development within their spheres without stifling innovations.

Financial Technology, commonly referred to as 'FinTech', represents one of such disruptions in the financial sector. This paper explores the role that FinTech can play in deepening the capital market, with specific focus on Nigeria. The paper goes on to discuss the state of technology use and opportunities in the Nigerian capital market and offers specific policy recommendations for operators, FinTech companies and regulators.

The remaining sections of this paper are divided into four. After examining the depth of the capital market in section two, the paper assesses financial and regulatory technology in section three. Section four is devoted to an assessment of technology use and opportunities in the Nigerian capital market while section five draws important policy implications and recommendations.

2. DEPTH OF THE NIGERIAN CAPITAL MARKET

The Nigerian capital market has developed over the years and can be described as deeper now than some years ago. Many products and platforms that were unavailable ten years ago are now operational. For instance, trading of Exchange Traded Fund (ETF), the establishment of the Financial Market Dealer Quotation (FMDQ) OTC, National Association of Securities Dealers (NASD) OTC and AFEX Commodity Exchanges are all recent developments.
The processes employed by these new products and platforms as well as those of the conventional ones have also improved. Technology has become increasingly important in both the operation and the regulation of the capital market. This is manifested in a number of ways such as remote/smart trading, electronic (internet-based) filing and reporting as well as some levels of automated market surveillance and supervision. In fact, some of the initiatives of the SEC aimed at developing the market (such as the E-dividend, Direct Cash Settlement (DCS) and Dematerialization) are largely technology-based.

The foregoing notwithstanding, the Nigerian capital market can do far better in terms of market depth. The current market capitalization ratio (equities plus bonds divided by GDP) of 20% is quite low for a country of over 190 million people andfar below those of many markets: 146.9% in the US, 121.3% in Malaysia and 322% in South Africa (Source). There are only 172 listed equities, lower than 174 recorded in 1993 and 217 in 2010.

Some of the key sectors that are driving national growth are equally not well represented in the capital market and trading in commodities is still at its infancy despite the huge agricultural potential of the country. Other challenges include low liquidity in trading especially from retail investors' side, high transaction costs and few hedging instruments such as derivatives.

As various efforts are being made to address many of these issues, application of technology will be relevant as a key component of most of the solutions.

3. FINANCIAL AND REGULATORY TECHNOLOGY

FinTech can be described as companies that use new technology and innovation to compete with traditional financial institutions in delivering financial services. They use their advantages of being flexible, closeness to customers and understanding of technology to deliver financial services. According to E&Y (2016), Fintech organizations combine innovative business models and technology to enable, enhance and disrupt the traditional financial services industries.

Closely related are the activities of Regulatory Technology (RegTech) firms which utilize informationtechnology to enhance regulatory processes, helping businesses comply with regulations efficiently and inexpensively. With the application of technology to financial services come various products, risks and opportunities. Regulators now have to make and enforce rules in a changing and innovative environment using technology. Having embraced FinTech, both the operators and regulators use technology to ensure compliance, drive down compliance costs, attain efficiencies and challenge the status quo in financial services provision and regulation.

There are various applications of FinTech to the capital market. Deutsche Borse (2016) classifies these into five areas discussed below.

i. **Core Market Infrastructure Technology:** Thistries to create safer and more transparent access to liquidity; develop efficient and intelligent platforms for trading and clearing; create/expand new asset classes and leveraging new technologies in the cloud and API interactivity to manage market infrastructure. An example is a Blockchain technology.

ii. **Post-Trade Digitization/RegTech:** Represents an avenue for automating the heavily manual processes that still exist within the compliance, regulatory and collateral management. RegTech companies have provided solutions in areas such as: regulatory filing and fraud prevention.

iii. **Artificial Intelligence & Analytics** are used to develop solutions based on in-memory computing and machine learning. They leverage on the massive swell of structured and unstructured (big) data to make predictions, and build analytics at the point of trade.

iv. **Investment Technology Digitization** comprises software which enhances investment decision-making. The growth of ETFs and passive investment strategies have made easier the applications of automated advisors (Robo advisory) and automation in asset allocation and rebalancing.

v. **Alternative Funding Platforms**allow alternative models for capital formation across the capital structure of both large institutions and SMEs. Lenders and borrowers can now connect directly online bypassing intermediaries. Examples include Peer-to-Peer (P2P) lending, Crowd-funding and Initial Coin Offering (ICO) of Virtual Currency and Tokens.

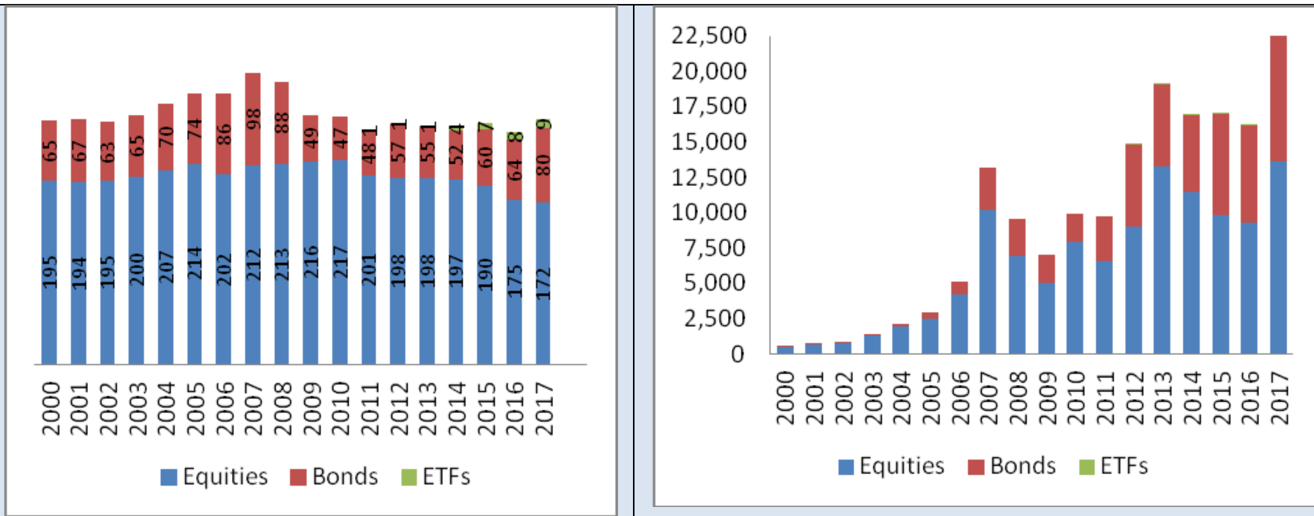
4. TECHNOLOGY USE AND OPPORTUNITIES IN NIGERIAN CAPITAL MARKET OPERATIONS AND REGULATION

The technology uses and opportunities of Self-Regulatory Organisations (SROs), Capital Market Operators (CMOs) and the regulator are discussed in this section.

4.1 Self-Regulatory Organizations (SROs)

i. **The Nigerian Stock Exchange (NSE):** The NSE is a self-regulatory organization providing a platform for listing and trading capital market instruments such as equities and bonds. Figure 1 shows the market capitalisation and number of the major instruments traded on the NSE. Panel '*a*' of the figure depicts that equities dominate in all the years andthe total number of listed securities was 260 in the year 2000 and rose to the peak of 310 in 2007. At the end of 2017, 261 securities were, comprising 172 equities, 80 bonds and 9 Exchange Traded Funds (ETFs). Panel '*b*' shows that total market capitalisation has risen from N472.3bn in 2000 to N22.92trn in 2017. The latter comprises equities N13.62trn, bonds N9.29trn and EFTs N6.7bn.

There are various ways in which technology has always been adopted on this platform. They include: Partnership with Reuters towards internationalization in 1987; Transition to Automated Trading System in 1999; Introduction of Trade Alert Scheme in 2005; Partnership with Reuters and Bloomberg for publishing real time data in 2009; Phone-in telephone service to confirm stockholdings in the depository in 2011; Direct delivery of real time and delayed market data feeds in 2012; Launching of new trading platform (X-gen) in 2013; Launching of Issuers' Portal (X-Issuer) in 2013; Introduction of the smart trade app in 2015; Launching of Nasdaq Smarts Surveillance in 2017.



a.Number of listed securities	b.Market capitalisation of listed securities (N'bn)

Figure 1: Number and capitalisation of instruments traded on the NSE
Source: SEC Statistical Bulletin

Emerging opportunities for FinTech include:Market data products: Index construction; Exchange Traded Derivatives; Operations of Central Counterparty (CCP); Regional Integration to facilitate seamless trade across West Africa; Algorithmic Trading; and High frequency trading.

ii. **Financial Market Dealer Quotation (FMDQ) OTC Securities Exchange:** FDMQ provides a platform for dealing in the Over the Counter (OTC) securities. The Exchange uses a Bloomberg e-bond trading system and Thomson Reuters with opportunity of having real-time access to prices of securities. Instruments traded on the FMDQ include, foreign exchange, treasury bills, FGN, corporate, supranational and euro bonds, repurchase agreements/buy-backs, unsecured placements/takings, foreign exchange derivatives and money market derivatives.

Emerging opportunities for FinTech include:
- Development of the retail segment of the bond market
- Provision of private bond information services
- Operation of a Clearing House (Real Time Operation)

iii. **National Association of Securities Dealers (NASD) OTC Securities Exchange:** NASD serves as a platform for secondary market trading of securities of unquoted public companies. It uses BITS software for trading unquoted equities with real-time access to prices of securities on the exchange.

Emerging opportunities for FinTech include:
- NASD Enterprise Portal linking enterprises to private investment.
- Crowd funding opportunities platform, subject to necessary amendments to the enabling laws.

iv. **AFEX Commodities Exchange:** AFEX serves as a platform for commodities transactions. It launched a Nasdaq OMX Trading System in November, 2017 for trading. The major commodities traded on the platform are white maize, soya beans, paddy rice, ginger, yellow maize, red sorghum, yellow sorghum and white sorghum.

*Emerging opportunities for FinTech include:*Operationalization of electronic warehouse receipt; Development of indexes; On-boarding of brokers; Warehouses connectivity to the Exchange; andDevelopment of Commodities Futures market.

v. **Central Securities Clearing System (CSCS):** CSCS provides a central depository for share certificates, Issuing of central securities identification numbers, legal entity identifiers and custody as well as settlement services for the capital market. The organisation recently completed its "Project Meridian", a new clearing, settlement and depository platform which replaced and improved on its existing process.

Emerging opportunities for FinTech include:Linking shareholders' accounts to BVN and leveraging on the linkage for KYC and other products; Role in the operation of a CCP; Role in the trading of derivatives; and Instant update of investor accounts using block-chain technology.

4.2 Capital Market Operators

i. **Broker/Broker-Dealer:** They purchase and sell securities on recognized exchanges on own and the clients' account. Technological applications in the following areas have recently affected their operations: Direct Cash Settlement, Online trading platforms, Connectivity with Exchanges and Real-time access to prices of securities on the exchanges.

Emerging opportunities for FinTech include: Data and information-based products and solutions; Data and predictive analytics; Participation in retail bond trading; Participation in commodity trading; Electronic KYC systems; Establishment of Alternative Trading System (ATS); Algorithmic Trading; High frequency trading; and Regional and portfolio expansion.

ii. **Fund Managers:** Fund Managers select and manage fund portfolio on behalf of investors. The Net Asset Value of the Collective Investment Scheme (CIS) under their management stood at N425.66bn at the end of 2017 and approximately three times this value is what they have as privately/discretionary managed fund. They currently operate e-filing and e-reporting to the regulator and have real-time access to prices of securities on the exchanges.

Emerging opportunities for FinTech include:

- Automated portfolio construction and rebalancing

- Automated investment advisory/Management

iii. **Registrars:** Registrars have the responsibility of maintaining register of companies' shareholders and unit holder of collective investment schemes and effecting appropriate changes in these registers. Recent Fintech innovations include Dematerialization, E-Dividend, Direct Cash Settlement, Electronic voting at AGM, Back-up and disaster recovery services.

Emerging opportunities for FinTech include: Linking shareholders' accounts to BVN; Seamless connectivity with CSCS and Banks for real-time shareholder register updates; Tele-conferencing of AGM; Opportunities in operating Clearing and Settlement infrastructure; Opportunities in operating a Central Counterparty; Role in derivatives trading and trade repositories; Data and information services and analytics; Role in crowd-funding and private instrument registration; Electronic distribution of annual reports; and Lowering regulatory/compliance costs for companies.

4.3 Capital Market Regulation

Technology is also useful in the effective regulation of the capital market. The Securities and Exchange Commission (SEC) as the apex regulator of the Nigerian capital market requires technology. Appendix A suggests that this task may be involved as there are 1,214 capital market operators that are registered for various functions and regulated by the SEC. Some of the functions of SEC, recent technology innovations adopted and way forward for Fintech applications are therefore highlighted below.

i. **Registration of Securities and Operators:** Current efforts include E-allotment following dematerialization and updating CMO database from MS Excel-based application to a Customer Relationship Management (CRM) Software. Additional opportunities exist in Platforms for tracking application and registration status, (e.g Automatic Identification of CMOs on their registration status), Decentralized examination at the zonal offices, On-line examination and registration, e-filing, e-registration and a robust archival and retrieval system.

ii. **Inspection of CMOs (on-site and off-site):** Current efforts include E-filing of CMOs returns/reports. Additional opportunities exist in establishing Minimum operating standards and technology for operators, Returns/filing uploading portal, Real time monitoring, Analytics and information processing and Application of technology to risk-based supervision.

iii. **Surveillance of Market/Trade:** Current efforts include real-time and post trade viewing. Additional opportunities exist in deployment of real-time market surveillance system/software.

iv. **Investigation and Enforcement:**Efforts are being made at the establishment of an e-complaint and management portal which presents an opportunity for more efficient complaint management system.

v. **Rule Making:** There are efforts made on internet exposure of proposed rules for feedback and final rules for compliance. Additional opportunities exist in on-line platform to digitalise, analyse, review and provide feedback on rules and regulations

vi. **Governance and Disclosure:** Efforts have been made in the areas of E-filling of company financials, distribution of electronic annual reports to shareholders, e-mail based returns and forwarding of deficiencies. Additional opportunities exist in Returns/filing uploading portal, Real time monitoring of CMOs financial position, Analytics and information processing.

vii. **Market Development:** In trying to develop the market and boost confidence, the Commission introduced direct cash settlement, e-dividend payment and dematerialization of share certificates. Additional opportunities exist in operators sharing services/software, Integrating Electronic Dividend Management Mandate System(E-DMMS)and Direct Cash Settlement(DCS) platforms, facilitating Innovation hub and application of Regulatory Sandbox.

5. IMPLICATIONS AND RECOMMENDATIONS

Discussed so far are the operations as well as recent and future areas where technology can be used to deepen the Nigerian capital market further. The following implications and recommendations offer some additional benefits to the CMOs, FinTech Companies and the regulator.

5.1 Capital Market Operators and FinTech

The Capital Market Operators (CMOs) need to embrace and adopt technology in carrying out their current activities and in planning their future operations. This is necessary for their continued existence and competitiveness. One way will be to study, purchase and use relevant technology. Another is to partner with FinTech companies to introduce new products or improve on existing processes.
The FinTech companies will also need to continuously engage CMOs to understand their operations and technological needs. This will also present an opportunity to introduce and instruct CMOs on the applications and benefits of their innovations. FinTech companies operating in Nigeria can also apply to SEC for relevant licenses needed to perform certain regulated capital market functions.

There are other ways that FinTech Companies can benefit from the capital market, including raising capital through Venture Capital and Private Equity firms to finance their operations and ultimately list relevant securities on one of the Exchanges at some point. FinTech Companies with some funds can also invest in existing securities in the Nigerian capital market, thereby providing liquidity and enhancing transparency.

5.2 Capital Market Regulator

The regulator of the Nigerian capital market will equally benefit from technology with certain implications for its processes, regulatory and development functions.

i. **Internal process and operations:** Improved adoption of technology will be needed for the current and planned operations of SEC similar to the case of the CMOs. This is necessary to maintain SEC's status as the apex regulator of the Nigerian capital market and keep up with the global development in capital market regulation. Huge investment will definitely be required in the training of staff and deployment of necessary tools and technology to understand and regulate evolving products and processes.

ii. **Market regulation:** Regulation must promptly respond to innovation. But it will be useful to first classify new innovation into i) new processes that do not necessarily lead to new products and functions; ii) new products/platforms which may or may not come with new processes. Regulation in the case of the former will likely be mild, comprising: study to understand new processes/platforms for the benefits and new risks (if any) associated with such processes; moderate modification to existing rules to incorporate new changes in processes/platforms; and encouraging new platforms that bring efficiency and lower costs.

    For new products and platforms however, there will be the need to understand the capital market components of such products, Identify and work with other regulators of these products, understand the benefits, risks and purpose which the new products tend to serve and establish whether such products could be regulated by existing rules or new rules have to be made or the existing rules have to be modified. There may also be the need to introduce regulatory sandbox for some products so as to understand how they work in case the existing rules cannot be easily modified to register them.When the activities of such products are risky, as it is in the case of ICOs and online retail forex trading, issuing warning to the public may be the necessary first step. This can be accompanied by preventing such platforms from soliciting funds publicly. In the interim however, the regulator needs to understudy such products and see whether there are benefits derivable if they are regulated and monitored. If this is true, such platforms can be registered, but the regulator may want to do so only when it has enough knowledge and tools to effectively regulate such products and platforms.

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This is because the public will see any registered platform as an endorsement from the regulator and will seek regulatory intervention during losses, which unfortunately is inevitable in such risky products. The regulator will also like to know the jurisdiction where traded products and platforms originated from. Such information will show the extent of innovation by indigenous Fintech firms as against mere marketing and trading of foreign products which often times can be highly speculative given little knowledge possessed on such products and their issuers.

iii. **Market development:** The regulator needs to encourage the development of innovative capital market products and processes that promote competition and efficiencies in financial services. In the case of Nigeria, this will also include innovations that support financial inclusion. For the purpose of market development therefore, there is need to contribute to building the capacity of the market participants alongside that of the regulator.

Some new products will require the establishment of Innovation Hub where businesses can display their innovative ideas and products in capital market. Also, a sandbox may be created to enable live testing of innovative products by firms in a controlled environment (Ivo and Kate, 2017). All these will require investment and various collaborations by the capital market regulator.

The foregoing suggests that the operations and regulation of the Nigerian capital market have been enabled by technology. However, there is a big room for improvements, given the recent development in the Fintech space. Potential areas of further technological applications have been identified for both the operators and regulators. It is therefore believed that if such applications are made, the Nigerian capital market will become deeper and catch up with some of its global peers in operations and regulation.

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APPENDIX A:

Number of Registered Capital Market Operators by Function

Function	2016	2017 (June)
Broker/Dealer	168	164
Broker	35	37
Dealer		1
Central System Depository	1	1
Commodity Pool Operator	1	1
Corporate/Individual Investment Adviser	109	110
Custodian	6	6
Estate Valuer/Surveyor	19	20
Fund Manager	14	12
Fund/Portfolio Manager	66	72
Issuing House	96	102
Market Maker	8	7
Rating Agency	3	3
Receiving Banker	22	22
Registrar	19	18
Reporting Accountant/Auditors	154	173
Solicitor	356	358
Sub-broker	15	31
Trustee	25	28
Underwriter	13	10
Venture Capital/Fund Manager	6	6
Property Manager	1	1
FMDQ OTC Dealer	13	11
Portfolio Manager	11	10
Securities Exchange/Over-the-Counter-Market	4	4
Inter-Dealer Broker	3	3
Private Equity Fund Manager	2	3
Total*	**1,170**	**1,214**

*Note that total is not representative of Total Number of registered CMOs each year, as a CMO may have multiple functions.