THE IMPACT OF MACHINE LEARNING/ARTIFICIAL INTELLIGENCE TECHNOLOGY ON THE FUNCTIONALITIES OF CORPORATE CONSUMERS IN THE FINANCIAL SECTOR OF EMERGING/FRONTIER MARKETS (USING NIGERIA AS A CASE STUDY)

ВЛИЯНИЕ ТЕХНОЛОГИЙ МАШИННОГО ОБУЧЕНИЯ / ИСКУССТВЕННОГО ИНТЕЛЛЕКТА НА ФУНКЦИОНАЛЬНОСТЬ КОРПОРАТИВНЫХ ПОТРЕБИТЕЛЕЙ В ФИНАНСОВОМ СЕКТОРЕ РАЗВИВАЮЩИХСЯ / ПОГРАНИЧНЫХ РЫНКОВ (НА ПРИМЕРЕ НИГЕРИИ)

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Annotation

In every country, the goal is to achieve a development target, every resource is pulled together to achieving this set goals, and one of the strongest hold to this will be the financial sector of each economy, the financial strength of both an economy and its citizens therefore becomes paramount and any technology that can streamline this and make the financial sector more healthy will be a welcome development.

Аннотация

В каждой стране цель состоит в достижении цели развития, все ресурсы объединены для достижения поставленных целей, и одной из самых сильных сторон этого будет финансовый сектор каждой экономики, финансовая сила как экономики, так и ее поэтому граждане приобретают первостепенное значение, и любые технологии, которые могут упростить это и сделать финансовый сектор более здоровым, будут приветствоваться.

Keywords: artificial intelligence, machine learning, financial sector, economy, Nigeria

Ключевые слова: искусственный интеллект, машинное обучение, финансовый сектор, экономика, Нигерия

In the case of developing countries, there is a limited amount of current literature, leaving a practical gap in academia. This is because the development of financial technology has impacted emerging markets, resulting in market participants using a range of different fintech solutions for different purposes. This gives rise to a research interest targeting the understanding and impact of innovation-driven growth on corporate clients in the financial sector of a market such as Nigeria. This could be considered relevant since a considerable number of authors or researchers focus mainly on exploring the views and perspectives of financial institutions (e.g. banks).

In addition, the research presented argues that consumer activities matter to the financial system, with a focus on corporate financial consumers (SMEs). This is because they constitute an underserved segment of the financial system in Nigeria prior to the market disruption as they lack customized financial packages or solutions. Accordingly, the research objective is achieved through the study of two distinct research objectives that focus on determining the influencing factors and consequences of financial technology on the activities or functions of smaller firms (as corporate clients). This prompts the research design to adhere to a qualitative method that focuses on gaining an in-depth

view of various respondents. This lends a sense of practicality to the research process, resulting in the research findings being useful to a range of stakeholders within the financial sector in Nigeria.

In summary, the research findings show that the development of a range of fintech solutions in a Nigeria has enabled smaller businesses to access easier finance. This is because the use of AI/ML algorithms to check creditworthiness serves as an advance over the traditional lending practices of banks that rely heavily on collateralization of loans. The research findings also indicate that the use of fintech solutions could lead to an expansion of credit risk, thereby affecting lending standards, as was seen during the global economic crisis (2007/08). This implies that the changes could be catastrophic for frontier markets as infrastructural conditions for the development of innovative solutions are limited. This leads to a recommendation that optimal checks and balances are required in the Nigerian financial sector to prevent investors from becoming increasingly risk averse.

INTRODUCTION

Following the current literature, one could consider the financial market as a social system consisting of a network of formal and informal economic agents interacting with each other to enable the flow of financial capital for different purposes. This leads to the hypothetical framework of the financial market (Figure 1), which provides a view of the key components that serve as driving factors that cause a trade-off between economic stability and market growth (Ernst, 2019). These factors include the social system, economic agents, and the mechanism of capital flow. The aforementioned key constituents have the ability to actively promote "opacity" in the financial market, which

can result in the presence of risk factors that lead to uncertainty. This gives rise to the view that a paradigm shift in the market may have encouraged systemic changes in the market system causing a misalignment with the neoclassical theory of economics/finance (i.e. individual rationality & profit maximisation). For example, the intertwining of "ethics, law and morality" in financial regulation has dynamically changed the financial environment since the creation of complex instruments, thereby altering participant behaviour and overall market welfare.

Furthermore, the ideas presented capture the importance of the financial system in terms of the presence of underlying risks, driven primarily by contemporary pressures. This is evident from a growing consensus among academic communities and industry practitioners on the effective functioning of the financial system (Akdugu and Umutlu, 2014). A biased focus can be observed in the discussions in the current literature. This is because the focus is mainly on the activities of financial institutions compared to other market participants. This is a gap in the literature as the financial market is an "open system" consisting of different actors at the micro, medium and macro levels resulting from the transformation of the market (Hopp et al., 2018). This suggests that financial consumers are as important as financial intermediaries as they can influence the uncertainty or volatility of the market. This implies that the research identifies a solution to the practical gap in the current literature, which could be filled by exploring the views of 'financial consumers' in relation to a particular topic of discussion. The research focus for financial consumers is on businesses compared to individuals as they take up a wider range of innovation driven financial products/services.

Consequently, the development of a well-functioning market driven by the emergence of disruptive innovations has intertwined financial and technological functions (Ramrathan and Sibanda, 2015). This may have affected the focus of central institutions (e.g. government agencies or policy makers) in different markets. This has led to research focusing on emerging markets, particularly 'frontier markets', a type of

developing market characterised by being more developed than the least developed market (Howell, 2015). This means that frontier markets could be considered as a set of economies that are too small, risky or illiquid to be considered as emerging markets. For example, Nigeria may be classified as a frontier market due to its lower market capitalization and liquidity compared to traditional emerging markets (Christensen et al., 2019). This view is supported by frontier market indices such as FTSE, MSCI, S&P and Russell. This allows the research to focus on the use of "Nigeria" as a case study, it includes serious lack in opportunities mostly as a result of the presence of extreme poverty, lack of infrastructure etc.

Nonetheless, the studies by Okafor et al (2017) and Olusola and Adesanmi (2018) suggest that the Nigerian market is key to creating innovation-driven growth. Recent patterns are characterised by exponential increase in data availability, computing power and machine learning methods. These patterns could foster the development of financial technology that competes with traditional methods in delivering value to different market participants (Guo and Shen, 2016). Accordingly, the presence of divergent views on the impact of financial technology could expose corporate financial consumers to heightened risks in terms of benefits and harms. The presence of different types of corporate consumers implies different levels of pressure from different stakeholders to ensure economic growth, social progress and environmental responsibility (Gualandris and Kalchschmidt, 2014). This results in the focus on "Small and Medium-Sized Enterprises (SMEs)" to facilitate access. They are seen as a strategic driver that will accelerate the growth of the Nigerian economy (Vanguard, 2018). This view is evident as SMEs account for about 90% of businesses in Nigeria by creating 80% of jobs and contributing to 54% of GDP in the region in 2018 (National Bureau of Statistics, 2019).

This could indicate that Nigeria as a frontier market is restructuring its economy through financial liberalisation and structural programmes along market-oriented lines. This is an attempt to facilitate the creation of a well-functioning environment where

intermediation in the financial market is sound to avoid the collapse of the economy (Agu et al., 2015). The reason is that financial technologies can make the mechanism of the market more complex through risk exposure. For example, financial technologies consistently provide SMEs with alternative ways to secure funds (e.g. crowdfunding), while they can easily trade across borders by removing barriers to entry. However, there are also potential risks, as SMEs can fall victim to Ponzi schemes resulting from weak regulation of financial technologies.

LITERATURE REVIEW

Section introduction

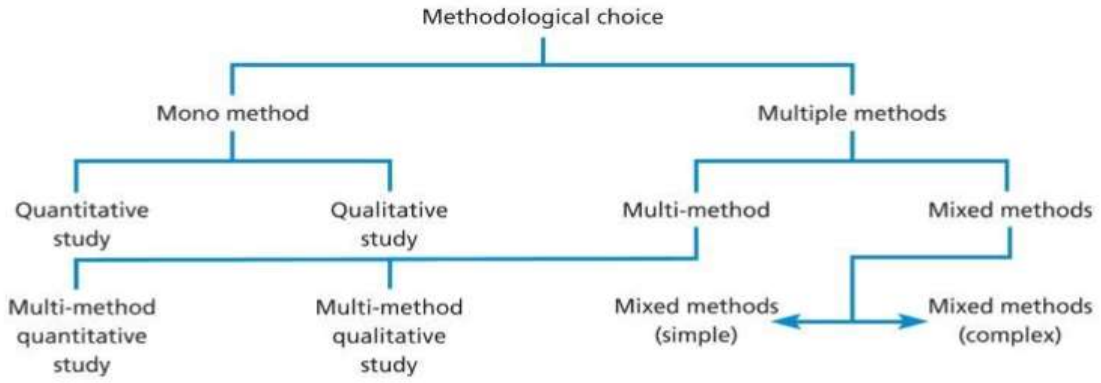
Research suggests that understanding the influences of disruptive innovations could provide coherent perspectives when applied to different markets or industries (Adegbile and Sarpong, 2017). It implies that the integration of different elements represents different worldviews that could serve as a way to understand different organisational realities. This view represents an underpinning assumption in the research of Kumaraswamy et al. (2018). It suggests that the tendency for indirect linkages across different markets represents a set of factors that may directly or indirectly affect the overall well-being of a business ecosystem. Therefore, this section seeks to provide an overview of the key sources within the academic discipline by critically assessing the existing body of knowledge to underpin the methodological paradigm of the research.

RESEARCH AND MARTERIALS

Daniel (2018, p. 5) suggest that a systematic understanding of the methodological dimensions of a chosen research has an impact on the suitability of the research direction and its requirements. This implies that research paradigms influence the researcher's perspective when attempting to justify approaches to making logical connexions and investigating a phenomenon. This implies that demonstrating a methodological analysis could provide an insightful awareness, discussion and justification of the key components that define and interpret the overall research process. This allows the

discussion to be underpinned by the research onion (Figure 8) proposed by Saunders et al. (2016, p. 124). It is a relevant methodological framework because it promotes a critical awareness of inherent problems and limitations that may arise. Furthermore, the involvement of human subjects leads to a variety of ethical issues, so discussions are tailored to demonstrate adherence to ethical procedures.

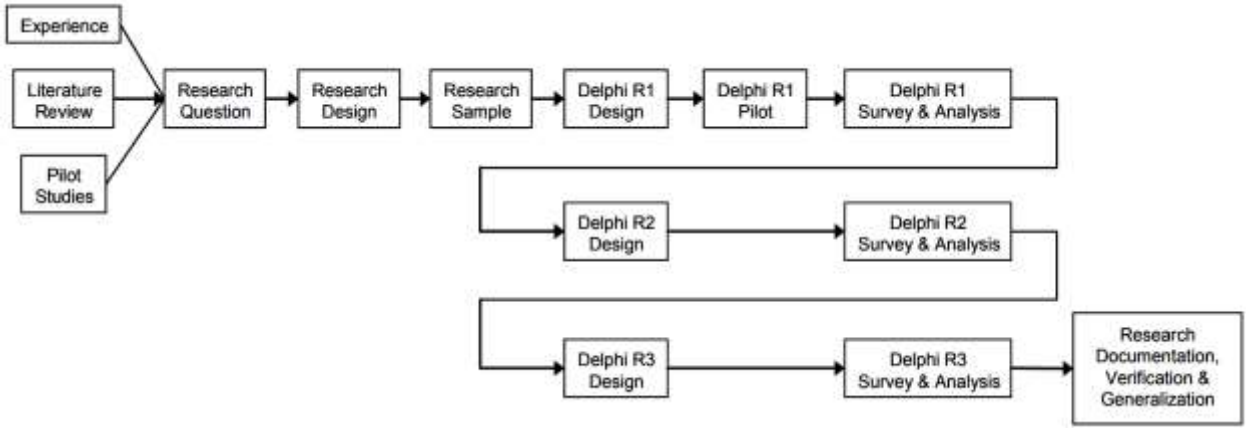
figure 1 Source: Saunders et al (2016)



The choice of methods (Figure 1) is a link with a selected theoretical framework and paradigmatic view (Lin and Wei, 2017). It indicates that the research adheres to a Mono-Method Qualitative Study by selecting one data collection method or technique that's underpinned by a constructivist paradigm. the selection of method has relevancy to the research field because it provides a way of documenting the perspectives, experiences and behaviours of others so as to attribute aiming to a social problem (or problems). the method is achieved by creating a narrative of people or groups interacting continuously while considering or determining the degree of influence each perspective and knowledge may wear the social organization (Jameel, 2018). as an example, the studies conducted by Jagtiani and John (2018) adhered to a qualitative study that promotes flexibility by

unfolding the scope of the research. this enables the research process to be conducted within the natural environment of the participants while assuming a spread of realities.

figure 2 Source: Skulmoski et al. (2007)



The Delphi process (Figure 2) offers a number of different stages that can be adapted to the needs of the given study. This is relevant because the chosen research aims to provide new knowledge within academic disciplines, so the methodology follows the subjective judgements of individuals and groups. The chosen research applies the Delphi process in the following ways:

Developing the research question: the initial research idea was derived from the researcher's own experience and career. It helped to express interest in the chosen research area, which was followed by a review of current literature to identify the existence of theoretical gaps. Once identified, a pilot study was conducted by participating in an online discussion platform consisting of interested individuals to solicit opinions. This process helps to guide one's logical reasoning for the conceptualization and design of the overall study framework, which is developed with the help of the supervisor.

Designing the research process: developing a feasible research framework leads to making critical insights into the strengths/weaknesses of different theoretical and methodological frameworks. It provides an opportunity to place the overall research in

a broader context, resulting in the chosen research adhering to a Qualitative Delphi Process. Intuitively, the process focuses on holistic views for unveiling and interpreting the complexity and therefore is the most promising method for answering the research area associated with the phenomenon under study. Moreover, the intended qualitative Delphi findings are derived through the use of semi-structured interviews consisting of closed and open-ended questions in order of increasing difficulty. It provides an opportunity to develop critical insights from the participants' perspective, which is evident in the studies of Koffi (2016) and Jagtiani and John (2018).

RESULTS

it is evident that the growth of Fintech has promoted the development of new banking models which aims to address several traditional difficulties thus attempts to support and meet the needs of underserved consumers. The assertion agrees to the findings by Rau (2018) which claims that new lending models such as crowdfunding or peer-to-peer (P2P) serve as a new global phenomenon. This is because it seamlessly connects lenders and borrowers thereby increasing the ease of access to the financial system and provide sophisticated investors with investment opportunities. Moreover, the respondent (R5) argues that the consequences of new lending models could be viewed from a negative perspective. This is because the process of assessing credit scores via lending platform utilises complex ML algorithms which could potentially be ‘black-box’. It results in opacity in credit decisions but useful as the credit model could make an unbiased decision thus helps to identify good borrowers from the pool of subprime corporate financial consumers.

DISCUSSION

From the research context, the growth of Fintech in a frontier market like Nigeria provides solutions to a number of corporate clients in their daily activities. It means that Fintech is continuously trying to fill practical gaps in the market through the presence

of innovative solutions that require minimal resources compared to traditional financial institutions. This is consistent with the findings of Leong and Sung (2018) who assert that Fintech strives to create business value, which serves as a new look for the financial sphere especially after the global economic recession (2007/08). Significantly, the findings suggest that the development of technology has gradually exacerbated changes in consumer behaviour patterns, rendering traditional business models irrelevant. This implies that the changes can be viewed from the perspective of different industries in Nigeria, leading to fintech solutions becoming a way to provide better user experiences at lower costs. This position is in line with the literature reviewed where Rachinger et al (2018) indicated that the digitization of financial processes appears to be leading to significant challenges.

CONCLUSION

From the research context, the growth of Fintech in a frontier market like Nigeria provides solutions to a number of corporate clients in their daily activities. It means that Fintech is continuously trying to fill practical gaps in the market through the presence of innovative solutions that require minimal resources compared to traditional financial institutions. This is consistent with the findings of Leong and Sung (2018) who assert that Fintech strives to create business value, which serves as a new look for the financial sphere especially after the global economic recession (2007/08). Significantly, the findings suggest that the evolution of technology has gradually amplified changes in consumer behaviour patterns, rendering traditional business models irrelevant. This implies that the changes can be viewed from the perspective of different industries in Nigeria, leading to fintech solutions becoming a way of delivering better user experiences at lower costs.

In summary, the use of fintech could negatively impact the functionality of smaller firms by exposing them to the risk of having a limited understanding of their important business decisions. This is because Fintech solutions that use complex AI/ML models

(e.g., Deep Learning) tend to be too complicated, so the decision-making process cannot be documented in detail. This is consistent with the views of Lu et al. (2018), who suggest that the complexity of Fintech models can lead to the creation of uncertainty in the business environment, which in turn leads to slow growth in the innovation curve. In summary, it can be asserted that the research findings and discussion are consistent with the initial assertions made in the previous sections. It implies that Fintech can be influenced by a number of technical and non-technical factors without being limited to the points discussed. The factors lead to different consequences from the perspective of different stakeholders, so that technological innovation has a strong tendency to disrupt the existing market system.

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