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Would Digitalization Project Impact Corporate Resilience? An Evaluation of the Nigeria Deposit Money Bank (DMB)

Deebii Nwiado[1] Leene Lezarsi Torbira[2] PhD; Onu, Kinsley Ezebunwa[3]
1.Department of Economics, Faculty of Social Sciences, Ignatius Ajuru University of Education, Port Harcourt, Nigeria
2.Department of finance and banking, university of Choba - Port Harcourt Nigeria
3.Department of Economics, Faculty of Social Sciences, Ignatius Ajuru University of Education, Port Harcourt, Nigeria
Corresponding author: *Deebii Nwiado PhD, Department of Economics, Faculty of Social Sciences, Ignatius Ajuru University of Education, PMB 5047, Port Harcourt, Nigeria.

Abstract
This paper examined whether digitalization of key functional units, product and service offerings by Nigeria deposit money banks (DMB) could stymie the steaming competition from Fintech startup firms. Four key bank performance indexes (KPI): - customer deposit, loan & advances to customer, asset under management and operational expense were isolated. Eight Nigeria deposit money banks (DMB) were randomly selected and designated either as, "highly or "less digitalized". The four selected bank key performance index (KPI), were tested, using rate (%) of change on a pair of a "highly and a less digitalized" bank. The highly digitalized bank proxied Fintech startup firms while the less digitalized are the normal banking firms. The results produced significant difference in favour of the less digitalized normal banks. In all the cases statistically analyzed, the less digitalized banks out performed, in all four key bank KPI, the highly digitalized Fintech startup firms. Our findings denied the much-orchestrated Fintech startup firms outperforming ordinary banks in the financial services market. Conclusively - excessive technological deployment adds tittle or nothing to banks' performance: revenue generations, competitive stamina and even resilience. Agbaje of Guaranty trust bank (G. T Bank) was right; "…. dominating the market is beyond just acquiring the best of technology." Fintech startup firms are no threat to the brick-and-mortar model.
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Overview and Introduction

This paper examined the recent surge in digital transformation projects embarked upon by corporate organisations across board. Our focused though is on the digitalization projects in the banking industry. The history of bank digitalization in Nigeria dates back a few decades to 1989 when the first Automated Teller Machine (ATM) was installed by the National Cash Registry (NCR) for the now defunct Societe Generale Bank of Nigeria (SGBN) https://www.studymode.com/essays/An-Assessment-Of-The-Use-Of-534707.html. Thereafter, digitalization of banking functions, consumer products and service offerings, went up fairly rapidly and have since then being the main tool of competition, not only heightening industry entry barriers, but also making banking service and product offerings cost effective. By the end of the last few decades, a number of banks in the industry, especially Nigeria deposit money banks (DMB), have digitalized most, if not all of its operations to ward off obsolesce and survive the intense competition driven by startup Fintech firms.

Recent digitalization projects in Nigeria deposit money banks, unlike in the past are driven by the dread of Fintech startup firms entry into the retailed financial services market, formerly an exclusive preserve of banks. Fintech firms are structurally lean, agile, innovative and are at the cutting edge of technology which they easily deploy to forestall competition. These features enabled Fintech startups to disrupt the conventional banking model that are naturally broad and in some case slow, at adopting technology. Unlike banks, Fintech easily leverages technology in its product and service offerings in the retailed financial market, insurance etc.

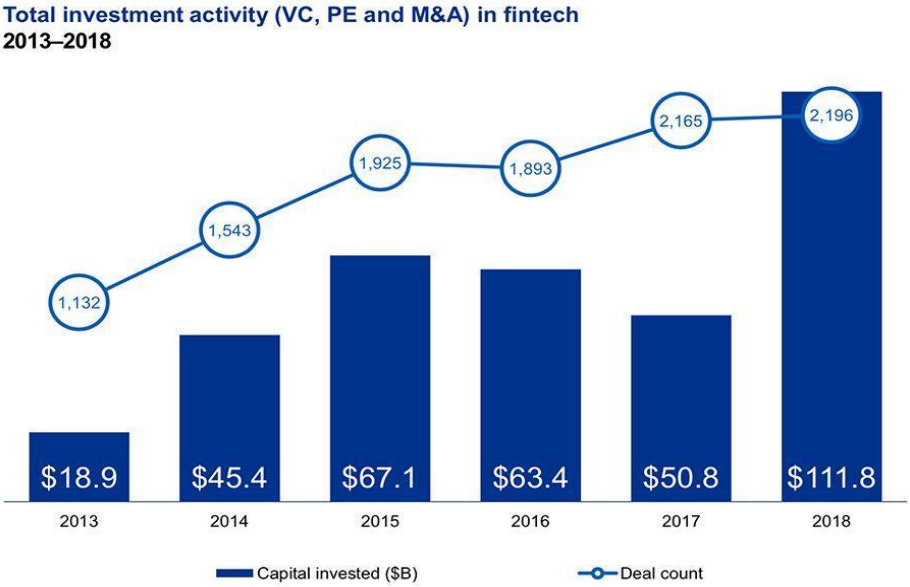
Even as startups, Fintech firms are lean and cost effective, able to deliver tailored financial services to consumers at comparably low cost. In reaction to the threats posed by Fintech firms to its core products and service markets, mortar and brick banks have resorted to massive digitalization, especially in the personal, retailed banking services and products, where Fintech startups competitive threats are intensive and fast moving. Are Nigeria deposit money banks (DMB) sufficiently cushioned by current digitalization projects? Will it provide the needed succor for Nigeria banks to remain afloat, stay competitive and be resilient to macroeconomic disturbances, a sure feature of the financial services market?

1.2 Background

The Nigerian banking industry that depends largely on earnings from retailed banking for over 80 percent of its

annual revenue and survival, appears to be drowning under the intense competitive heat generated by Fintech firms. Price Water Copper (PwC) in a recent (undated) report noted, "Africa is home to more than 400 Fintech firms. The continent's three key hubs are: – South Africa, Kenyan and Nigeria – accounting for a larger proportion of the Fintech firms." Thus, putting traditional banking model under steaming competition pressure.

Fig 1.1



Source: Consultancy.eu

Fig.1.1 above presents the global growth in Fintech investments from 2013– 2018 which appears to be increasing at geometric progressions. By 2020 global investments in Fintech reached $105.3 billion across 2,876 deals. (Jennifer Samuel 2020). In Africa, Fintech investments amounted to a whopping over $53-million in 25 in disclosed deals (Timm 2019).

Only when threats from sleek Fintech startups became so palpable in the immediate past decade of the 90s, did Nigerian deposit money banks (DMB), which appeared to have been completely oblivious of the astonishingly low entry barrier to the Nigeria retailed financial service markets woke up to the competitive threats posed by Fintech startups to its existence. Nigerian banks only lately came to the realization that the days when fixed assets (example branches) served as deterrent (entry barriers) into the financial markets were over. As the internet technology emerged in the 1980s, upstarts Fintech firms with lean cost structures, enabled by technology were capable of virtually running financial services online.

The popularity of Fintech startups in Africa, and it's phenomenal growth in countries (South Africa, Kenya and Nigeria) of sub-Sahara Africa is attributed to a number of key factors. Young and growing populations - the current demographic ecosystem of many African nations–Nigeria, Kenya and South Africa regarded as key hubs, support the growth of Fintech firms, due to their tendencies to consume the technology being launched in the markets. It is further argued that the wide-spread mobile phone access through smartphones on the continent estimated to reach 525 million by 2022, also drives the Fintech industry in sub-Sahara Africa countries.

Africa's poor financial inclusion provides another explanation amongst others for a thriving Fintech industry in sub-Sahara African market. The Low levels of financial inclusion in the formal banking systems in the entire continent drives the growth of Fintech, with companies incentivized to tackle this situation and offer solutions. Chris Steward, cited by Jonathan Gregson (2019), said of this: "The lower the level of financial inclusion in a country, the greater the opportunities for Fintech and consequently the more likely that the regulator will take a more tolerant view of the range of their activities." Diverse product offerings together with little financial inclusion in the formal banking system across the continent, make payment solution providers dominate the Fintech key hub markets of sub-Sharan Africa.

Faced with the intensed competition driven by Fintech startup firms, banks are advised to reduce cost-to-income ratio and not add on functions. In its most recent Global Banking Annual Review (December 2020), McKinsey & Company recommended that banks should build what it calls "productivity engine": improve its capital management capabilities and re-build its risk-management muscles to stymie competition. From indications, Nigeria deposit money banks (DMB) may not sufficiently achieve cost savings enough to ward off the steaming competition from Fintech startup firms only in a massive one-off digital implementation programs. Rather, a mindset and capabilities – reset third party spending, move to minimum viable central functions and dedicated to continuous improvement aimed at greater productivity and better customer experience could generate the needed resilience for deposit money banks to stay competitive and afloat in the new hostile global financial market system.

1.3 Conceptualization and general discussion

Though the concept "Fintech" is fairly ubiquitous in today's financial services industry literature, and could almost be taken for granted, we attempt to clarify what truly it conveys and its different applications. Kagan (2020), reviewed and updated by Estevez (August 2020), conceptualized Fintech as: "a new technology that seeks to improve and automate the delivery, and use of financial services." Though the name "Fintech" pointedly situates it to fit financial services and product offerings, applications of the new technology cuts across industries. Fintech assist business owners, consumers and managers to better manage their financial operations. "In other words, Fintech simply puts, promotes the use of digital technology to come up with innovative products such as mobile payments, alternative finance, online banking, big data and overall financial management." *(ibid)*.

In a consultative document issued (2017), the Basel Committee on Banking Services (BCBS) adopted the Financial Stability Board's (FSB) working definition which conceptualized Fintech as: "technologically enabled financial innovations that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services." Innovation appears to be the ubiquitous denominator in most of the definitions of Fintech because its' financial services delivery and products offering are by and large "innovative."

Consumer credits offered using Fintech technologies is less cumbersome, inexpensive and some cases initiated and concluded by the consumer. Example, cash credits offered by a number of Nigeria deposit money Banks (DMB). Besides, that Fintech firms could simultaneously operate in several financial markets: retail financial market, insurance, cryptocurrency, consumer banking, asset management and payment solution is innovative enough. More generally, Fintech encompasses any emerging technology that offers faster and more efficient means of delivering products and financial services that the traditional mortar and brick banks currently dominantly available in the financial market are unable to provide.

Fintech applications vary depending on specializations. Payment Gateways or platform are electronic payment systems which had been around before e-commerce was born. These online payment systems have revolutionized payment, making it convenient, easy, and highly accessible to all (financial inclusion). The most notable contribution of payment gateways is that they enable people to send money, circumventing the expensive service charges of the traditional mortar and brick model. By avoiding expensive bank charges, payment gateways afford consumers considerable leverage - cost savings from bank charges. Examples of payment gateways is:

> PayPal - founded in 1998, is a major player in the online payment systems in particular, the electronic money transfers. PayPal has over 286 million active account holders. It is a U.S.-based payment gateway and operates in over 200 markets across the world and in over 100 currencies. Its total revenues for 2018 reached US$15.45 billion. (https//financesonline.com/what-is-fintech).

Consumer Banking – *this is another category of Fintech that has taken the world* by storm in the consumer banking segment, in particular the retailed financial market. A typical consumer Fintech is a provider of alternative banking services. It offers banking products and services mostly to the several unbanked sub-Sahara Africans. Banks' exorbitant charges, make it unaffordable for the average persons to avail their services. The Fintech's alternative consumer banking product offerings are designed to address this long-standing issue. By making financial products and services accessible, Fintech firms provide affordable alternative for consumers.

Robo-Advising and Stock-Trading Apps have altered practices in the asset management sector. This innovative Fintech service uses smart algorithm technology to provide intuitive asset recommendations. In effect, Robo-Advising has reduced portfolio management troubles and achieved unprecedented efficiency, by lowering the costs of portfolio management. Financial advisers can now analyze numerous portfolio options more efficiently, 24/7, simultaneously. No wonder, an increasing number of Robo-advising services continue to emerge in the industry.

Though Fintech is consistently generally conceived as an innovative modern technological outfit that is easily deployed in the financial services and product markets, its services vary amongst startups Fintech firms. The challenge though remains to assess its true impacts on competition in the financial services market place. Conventional banks are jittered by the surge in Fintech's financial service and product offerings in the different segments of financial services markets, which in the past were exclusively dominated by banks. This paper is intended to logically assess the different services and product offerings available through Fintech, and determine the level of resilience recent bank digitalization projects could offer banks in the competitive market place. We ask the question whether the surge in digital projects by banks will help put them at par with Fintech firms in smart product and services offerings.

"Corporate resilience" is conceptualized, in the context of this paper, to define the ability of a corporate organization (a bank) to stand competition in the market place and remain a going concern into the far undefined future.

The Nigeria banking industry has in the past few decades witnessed a number of turbulent industrial experiences. The bank consolidation exercised of 2004 triggered by the Central Bank of Nigeria (CBN) reduced

the numerical strength of banks in the industry from some eighty banks to about twenty-five of today. Thereafter a number of other reforms have followed aimed at making Nigeria one of the World largest economics in which banks will play prominent roles. But the sudden appearance of lean cost-effective Fintech startup firms in the financial services market, a core banking terrain, beginning late 90s' generated a new competitive challenges or financial stress for Nigeria deposit money banks (DMB).

1.4 Measuring bank resilience and competitiveness

Measuring bank resilience and competitiveness, operating in the same market with lean cost-effective Fintech startups in the core financial service markets could pose some challenges. This we could achieve using bank key performance index (KPI) as; Customer deposit account size, loan and advances to customers etc. These are financial assets which could provide sufficient competitive edge for a bank. We will use them to measure a bank resilience (strength) in the market place. It is only banks with strong financial capabilities, that are able to stay and stand competition in the market place far into the unforeseeable future. Loan and advances to customers generate interest revenues that keeps a bank afloat. Granting loans and advances to customers are the core business functions of a bank and interest charges earned on these transactions provide the most significant sources of revenues for banks. Customer deposits provide banks almost a cost-free fund with which banks disbursed loans and advances to customers to earn interests.

Asset under management is an indicator of the size of a bank's wealth and speaks volume for the bank's financial strength. The larger the size of a bank's asset, the stronger the bank. Low banking expense compares it with Fintech startup, which are naturally lean and cost efficient structurally. By conjecture, we believe banks that are highly digitalized should have lean cost structure and be efficient to enjoy low operational expense, like Fintech firm. In this work, bank operational expense is defined by "personal expense" alone which excludes other operational expense. Other operational expense varies greatly in their contents and spread amongst banks; they therefore do not provide a consistent measure for the estimation of cost reduction probably enjoyed by a highly digitalized bank.

By conjecture banks that deploy technology through highly digitalized functional units and services offerings, should have large customer account volume (customer deposits) and should also be able to dispense loans and advances easily to customer via technology like their Fintech counterpart. We hypothesized; these banks should earn large interest spreads to remain resilience to competition. We use these bank key performance indicators (KPI) conceptually clarified here to access the ability of a bank to stay competitive and remain resilience in the financial service market place in the face Fintech competitive threats.

2.0 Review of literature

The term "Fintech" has exploded in popularity in recent years and is used variously to describe a wide array of innovations and actors in a rapidly evolving financial environment. Assessing the possible impacts of Fintech startups on banking core markets, Dietz, M. et.al (2016) noted, "Banking historically has been one of the business sectors most resistant to disruption by technology". These authors further asserted, "Banks have "special status" of being regulated institutions that supply credits, the lifeblood of economic growth, and have sovereign insurance for their liabilities (customer deposits). Consumers have generally been slow to change financial-services providers." In other words, Fintech, though common place and operating on several fronts, poses very little or no threats to core banking markets and the continuous existence of the banking industry. Bank as a financial institution remains uniquely and systematically important to society and the economy of all nations. Unlike startup Fintech firms, banks are in a highly regulated industry and offer insured security.

A report dated (2019) and titled: "Fintechs in Sub-Saharan Africa an overview of market developments and investment opportunities." co-authored by Hientz & Bhatia elaborated a "Fintech ecosystem framework" in sub-Sahara Africa. For a thriving Fintech landscape to evolve, Hientz & Bhatia postulated, "there must be a local Fintech ecosystem in place." Like the Fintech sectors in more developed financial markets, the payment segment of Sub-Sahara Africa (SSA) Fintech is the most dominant. The large unbanked population and the correlating high demand for financial inclusion, together with a high concentration of mobile phones in the sub region, make the Fintech payments segment the most dominant in SSA Fintech landscape *(ibid).*

Hientz & Bhatia *(ibid)* named the "four pillars" of a local enabling Fintech ecosystem as: Talent, Demand, Policy and capital. According to these authors, sub-Sahara Africa (SSA) boast of the most vibrant and fastest growing workforce globally, which is predicted to represent over 25% of the global workforce by 2050. Yet in the face of this, only limited employment opportunities exist in the local market. The demand for Fintech products and service offerings is overwhelming in the key Fintech hub economies: South Africa, Nigeria and Kenya. This is due mainly to the fast growing and the large unbanked population in these countries. These together with an underdeveloped financial sector, which in some cases leave large chunks of economically viable markets (asset, portfolio management, mortgage, commodity etc.) barren, created the high demand for Fintech firms which now offer these services and product thus substituting banks services in these markets.

Equally important is the policy landscape that exist for Fintech start-ups in the majority of SSA countries. Governments in SSA are starting to be supportive and interested in the development of Fintechs and their innovative capabilities. But the situation in Nigeria is slightly different. For example, the exclusion of Fintech from using BVN as an identification for prospective customers is a serious hindrance for Fintech growth and development. Yet Nigeria is one key Fintech hub in sub–Sahara Africa due to its large and ever-growing unbanked population albeit financial exclusion. "There are vast potentials for growth: Nigeria has the largest population in SSA (60% unbanked), and the population of Lagos is expected to double in the next 15 years." *(ibid)*.

Kola-Oyeneyin et al (2020), noted; "a youthful population, increasing smartphone penetration, and a focused regulatory drive to increase financial inclusion and cashless payments……" as the Fintech industry driver in Nigeria. Besides, the large unbanked Nigerians, (only 32% of Nigerian has debit card. United Nations Statistics Division (2017). The civil population continue to increase guaranteeing future prospects to the growth of Fintech firms in the sub-region.

Yermack (2018), in a (NBER WORKING PAPER SERIES No. 25007) discussed the emergence of Fintech in Kenya in sub-Sahara Africa, focusing on M-Pesa, a Fintech firm lunched in 2007 by Safaricom, an affiliate of Vodafone. Yermack asserted that, more rapid growth of Fintech in sub-Sahara Africa and most of the developing countries is impaired by the inadequacies of electrical and communications infrastructure. These countries, going by Yermack assertion, "have only limited, unreliable access to broadband Internet connections and smartphone handsets." Confirming this assertion, data from the www.internetworldstats.com; databank.worldbank.org; showed Nigeria, a key Fintech hub in SSA having only 61% electrical penetration, 50% internet penetration and 80% mobile phone penetration. These do not compare favourably with South Africa, another Fintech key hub with 65% electrical penetration, 85% internet penetration and 79% mobile phone penetration**.** (See Appendix A) for details penetration index for the rest of SSA countries.

Agoboola (2014), discussed the banking industry response to the threat posed by Fintech firms in the financial services industry. He noted that banks have evolved newer models such as internet banking, mobile banking and even new business units have emerged within the banking sector following the digitalization of banking functions and services all intended to face off competition from Fintech. Graham (2021), recommend banks to play "the Fintech game." "Fintech is assumed to be a modern movement, yet the use of technology to assist financial services offering is by no means a recent phenomenon. Financial services is an industry that introduced credit cards in the 1950s, internet banking in the 1990s and since the turn of the millennium, countless payment technology." Implying that, the banking industry was even in the market of offering financial services and products using technology long before the arrival of Fintech.

Still on the repose of banks to the presumed threats from Fintech in the financial service market, Agbaje, the Chief Executive Officer (CEO) of Guaranty Trust Bank (GT Bank) expressed no fears of Fintech: "The emergence of Fintech and Network providers in the banking sector doesn't frighten me despite their disruption of the banking industry." "I have no fear for Telcos; we are ready for Telcos. All we ask for is an equal level playing field. Furthermore Agbaje noted; "winning the digital payment race or dominating the market is beyond just acquiring the best of technology, because technology will become a commodity available to all…technology will never be the differentiator." By this assertion, Agbaje suggest that Fintech's only competitive edge - technology has a short life product cycle and not as lethal as it is generally thought to be. This paper agree with Agbaje, technology as we know them are hardly durable.

We agree with Abbasi and Weigand's (2017) argument, "digital financial services (DFS) expand the delivery of traditional banking services to the customers through innovative technologies like internet banking, mobile-phone-enabled solutions, electronic money models and digital payment platforms." Our concern though remain the protection digitalization project could offer banks in the face of acrid competition from cost effective startup Fintech firms that effectively compete in traditional banking business financial services markets.

2.2 Hypothesis

Following arguments and the different strand of thoughts so far expressed in this paper, we hypothesis thus:

(i) The recent surge in conventional banking industry digitalization investments may not significantly improve banking sector profitability as it is expected.

(ii) Fintech firms though agile, cost effective, able to innovatively deploy technologies and structurally slim, may not, even in the long unforeseeable future, be able to out compete or obliterate conventional banks in the Nigeria Financial service markets space.

Dietz, Khanna, Olanrewaju, and Rajgopal (2016), noted: "Banking has historically been one of the business sectors most resistant to disruption by technology." "Banks have built robust businesses with multiple moats: ubiquitous distribution through branches; unique expertise such as credit underwriting underpinned by both data and judgment; even the special status of being regulated institutions that supply credit, the lifeblood of economic growth, and have sovereign insurance for their liabilities (deposits)." These overwhelming profiles of conventional banks make them almost unassailable, and not susceptible to some instant market competition from a sector with

practically no history. Like the dot.com, Fintech could be an "ill wind" with a short life and blows nobody any good.

3.0 Methodology

We tested the two hypotheses stated in section 2.2 using selected banking sector bank key performance indicators (KPI). Because our data are mined from the annual reports of the selected banks, they do not qualify as time a series data by nature. We will analyze our hypothesis, using descriptive statistical tools such as: rate (percentages) of change, histogram, graphs and charts etc. We compare achievements (performance) of the four selected banks with highly digitalized functional units and services offering with the four others with less digitalized functional units, product and service offerings. The highly digitalized banks proxy fintech firms.

The less digitalized banks represent the normal banking firms. The result obtained will proxy the standings or resilience of banks versus Fintech startup firms in the competitive market. Has digitalization impacted banks' resilience, improved their competitive stamina so they are able to stand the steaming competition generated by Fintech firms' activities in the financial services market. If digitalization has been successful, how about the ever overcrowded and commotional banking halls across Nigeria?

The literature is brimful with several approaches to measuring bank performance including using key bank performance indicators (KPI). An anonymous source defined key performance indicator (KPI) for banks as: "a metric that can be successfully used to evaluate the success of a bank as a whole down to individual bank employees." From industry standard, financial performance metrics as Return on Assets (ROA) and Return on Equity (ROE), to more operationally focused metrics as accounts opened per employee and operating expenses as a percentage of assets as indicators are able to identify increase or shrink in a bank's profits. Digitalization is more of an operational enhanced tool for banks. This paper intends to establish a relationship between digitalization of banks and their performance in operational related areas: loan and advance to customers, customer deposits penetrations, personal expense and asset under management. We operationalize KPI that are enhanced by digitalization.

3.1 Data Construction

Four highly digitalized Nigeria banks proxy fintech start up firms: First Bank, Guaranty Trust (GTB), Zenith and Access Banks are randomly selected against: First City Monument (FCMB), Stanbic IBTC, Fidelity and Sterling banks less digitalized in operations and functional units that proxy normal banking firm. The status of either "highly or less digitalized" is not informed by any known objectively defined criteria. We designate a bank either as "highly or less digitalized" based on the frequency of her products and services (online) offering on the information technology high ways: google, networks, internet sport advertisement. A second criteria is the extent of digitalization of functional units, product and service offering. These products and services offering as key bank performance indicators (KPI) viz are chosen:

a) Customer deposits – the size of customer deposits earlier

explained variously in this paper is adopted to depict the benefits of liquidity of a bank. Customer deposits, though reported on banks' balance sheets as liabilities, are in reality an asset to a banks. Customer deposits provide needed liquidity banks use to dispense loan and advances to customers to earn interest spread which generate huge revenue to banks and contributes to it sustainability.

b) Loan and advances to customers – this tell us the benefits of

A banks earn by granting customer credit facilities. It is selected to report the additional benefits realized following digitalized function related to customer loan and advance dispensed using information technology traffic.

c) Asset under Management AUM). This is variously defined –

trading asset, financial assets held at fair value through profit or loss etc. Generally it refers to "how much money a hedge fund or financial institution is managing for their clients." Deployment of information technology, we believe, should quicken the acquisition of large asset to be managed. Also, value of asset under management (AUM) is a measure of the size of a financial institution and a key performance indicator of success. https://opsdog.com/resources/5-key-performance-indicators-for-banks-to-benchmark/

d) Banking operation expense – is a generic name, and it reports

different operating expenses ranging from "personal or staff cost", "administrative expense", and "other expenses." For this paper, we chose to operationalize "personal expense or staff cost." Accounting notes details for personal expense, unlike the other expenses, coalesced around similar items across banks. It thus provides a good basis for a rational analysis of bank operating expense. Staying competitive and resilient, a bank must regularly work to reduce it operational costs. To cut costs, and to simply survive, banks must transform their digital initiatives. Paul Krugman, a Nobel price economist, once said, "a company's financial health isn't just about money coming in: It's also about money going out." Has Bank digitalization projects reduced operational costs to keep bank operations cost competitive and increased money coming in?

Table 3.1 (A) and (B) below list the four key performance indicators (KPI) for banks covering 10 (ten) years

period of data. Using conjecture, we selected eight: four banks we consider highly digitalized: – Access, First, Guaranty Trust and Zenith Banks; and four others considered to be less digitalized: – FCMB, Fidelity, Sterling and Stanbic IBTC Nigeria deposit money banks (MDB) to test the impact of the deployment of information technology. We compute percentage changes (negative or positive) in the selected key performance indicators (KPI) over a period of ten years for each bank and compare results to determine the impacts of technological deployment

HIGHLY DIGITALIZED BANK 2010					LESS DIGITALIZED BANK 2010				
BANK	Asset Under Magt ₦'000	Banking Opt Expen ₦'000	Loan & Adv. to Customer ₦'000	Customer Deposits ₦'000	BANK	Asset Under Magt ₦'000	Banking Opt Expen ₦'000	Loan & Adv. to Customer ₦'000	Customer Deposits ₦'000
Access Bank	N/A	38,797,403	403,178,957	440,542,115	FCMB	71,916,099	28,369,962	323,531,060	334,897,851
First Bank Holding	309,292 (M)	107,392(M)	1,046,925 (M)	1,330,771(M)	Fidelity Bank	41,006 (M)	29,235 (M)	158,516 (M)	327,351(M)
Guaranty Trust Bank	148,872,254	13,691,132	563,383,562	753,088,230	Sterling Bank	96,593,620	15,162,982	99,312,070	199,274,284
Zenith Bank	171,185 (M)	89,074 (M)	667,860 (M)	1,289,552(M)	Stanbic Bank	37,689 (M)	29,820	164,203(M)	187,595
				2011					
Access Bank	5,787,534	38,964,674	490,877,501	522,599,292	FCMB	3,010,135	29,648,123	315,101,376	410,578,646
First Bank Holding	550,368 (M)	134,786(M)	1,128,851 (M)	1,784,490 (M)	Fidelity Bank	89,776 (M)	38,387(M)	255,257(M)	561,089(M)
Guaranty Trust Bank	173,297,556	17,851,900	679,358,919	1,026,119,419	Sterling Bank	194,785,083	20,442,336	159,734,616	406,515,735
Zenith Bank	265,164 (M)	108,450(M)	767,372 (M)	1,575,977 (M)	Stanbic Bank	60,530(M)	36,029	230,707(M)	295,905(m)
				2012					
Access Bank	3,769,260	28,412,192	554,592,199	1,093,979,220	FCMB	685,664	18,545,334	357,798,798	646,216,767
First Bank Holding	1,942(M)	168,908(M)	1,316,407(M)	2,171,807(M)	Fidelity Bank	241,663,451	16,758,471	350,489,990	1,099,437
Guaranty Trust Bank	267,417,182	18,468,570	742,436,944	1,054,122,573	Sterling Bank	1,998,860	9,392,577	229,420,874	463,726,325
Zenith Bank				1,802,008 (M)	Stanbic Bank	114,877(M)	21(M)	266,344(M)	355,419(M)
				2013					
Access Bank	3,877,969	25,937,818	735,300,74	1,217,176,793	FCMB	2,921,358	70,379	450,532,965	715,214,192
First Bank Holding	2,225(M)	159,119 (M)	1,473,893(M)	2,570,719 (M)	Fidelity Bank	254,909 (M)	25,629 (M)	426,076 (M)	806,320(M)
Guaranty Trust Bank	13,746,682	19,625,269	926,967,093	1,261,927,035	Sterling Bank	2,200,994	10,266,263	321,743,748	570,511,097
Zenith Bank		27066(M)	1,126,559 (M)	2,079,262(M)	Stanbic Bank	40,71 (M)	456 (M)	289,747 (M)	416,352(M)
				2014					
Access Bank	N/A	25,611,051	1,019,908,848	1,324,800,611	FCMB	741,917	306,667	617,979,790	733,796,796
First Bank Holding	9,258(M)	63,011(M)	1,794,037(M)	2,551,015 (M)	Fidelity Bank	83,363(M)	25,874 (M)	541,686 (M)	820,034(M)
Guaranty Trust Bank	5,675,545	21,036,543	1,182,393,874	1,439,522,070	Sterling Bank	1,949,460	12,031,026	371,246,273	655,944,127
Zenith Bank		67,848(M)	1,580,250(M)	2,265,262(M)	Stanbic Bank	96,345 (M)	455 (M)	398,604(M)	494,935(M)

Table 3.1: (A) Bank Key Performance Indicator (KPI): Highly Digitalized v. Less Digitalized Bank

Source: Generated by the Authors from Banks' (2010 – 2019) Annual Reports

HIGHLY DIGITALIZED BANK 2015					LESS DIGITALIZED BANK 2015				
BANK	Asset Under Magt ₦'000	Banking Opt. Cost ₦'000	Loan & Adv. to Customer ₦'000	Customer Deposits ₦'000	BANK	Asset Under Magt ₦'000	Banking Opt. Cost ₦'000	Loan & Adv to Customer ₦'000	Customer Deposits ₦'000
Access Bank	10,403,608	35,699,471	1,243,215,309	1,528,213,883	FCMB	1,994,350	238,360	592,957,417	700,216,706
First Bank Holding	5,049(M)	63,672 (M)	1,457,285 (M)	3,104,221 (M)	Fidelity Bank	4,070 (M)	27,125 (M)	578,203 (M)	769,636 (M)
Guaranty Trust Bank	25,075,618	20,727,835	1,265,207,443	1,422,550,125	Sterling Bank	4,692,636	12,101,326	338,726,271	590,889,216
Zenith Bank	150,724(M)	62,235(M)	1,849,225(M)	2,333,017(M)	Stanbic Bank	37,956 (M)	429 M	353,513(M)	493,513(M
			2016						
Access Bank	14,871,247	42,155,587	1,594,562,345	1,813,042,872	FCMB	9,154,198	218,167	659,937,237	657,609,807
First Bank Holding	23,482(M)	702(M)	65 (M)	3,104,221 (M)	Fidelity Bank	18,098 (M)	27,231 (M)	718,401 (M)	792,971(M)
Guaranty Trust Bank	6,321,370	20,704,772	1,417,217,952	1,681,184,820	Sterling Bank	1,652,863	11,521,854	468,249,870	584,733,896
Zenith Bank	118,622(M)	62,428(M)	2,138,132 (M)	2,556,963(M)	Stanbic Bank	16,855(M)	500(m)	352,965(M)	560,969(M)
				2017					
Access Bank	20,257,131	41,773,512	1,771,282,739	1,910,773,713	FCMB	23,936,031	265,056	649,796,726	689,860,640
First Bank Holding	83,713(M)	982 (Mil)	108 (Mil)	3,143,338	Fidelity Bank	20,639 (M)	24,535 (M)	768,737 (M)	775,276 (M)
Guaranty Trust Bank	16,652,356	22,354,351	1,265,971,688	1,697,560,947	Sterling Bank	6,883(M)	11,545(M)	598,073 (M)	684,834(M)
Zenith Bank	117,814(M)	55,672(M)	1,980,464 (M)	2,744,525(M)	Stanbic Bank	151,479 M	590 M	372,088 (M)	753,642 (M)
				2018					
Access Bank	23,839,394	40,425,816	1,681,761,862	2,058,738,930	FCMB	47,426,813	19,727,544	569,900,550	802,853211
First Bank Holding	3,427 (Mil)	904 (Mil)	110 (M)	3,486,691(M)	Fidelity Bank	14,052(M)	23,910(M)	849,880 (M)	979,413 (M)
Guaranty Trust Bank	8,920,153	23,681,401	1,067,999,019	1,865,816,172	Sterling Bank	4,110(M)	13,194 (M)	621,017 (M)	760,604(M)
Zenith Bank	156,673(M)	56,657(M)	1,736,066(M)	2,821,066(M)	Stanbic Bank	84,351 (M)	1,662 (M)	441,261(M)	807,692(M)
				2019					
Access Bank	28,291,959	60,712,847	2,481,623,671	3,668,339,81	FCMB	50,923,740	22,228,216	649,663,453	918,301,254
First Bank Holding	3,057 (Mil)	1,201(M)	94 (M)	4,019,836 M	Fidelity Bank	45,538(M)	24,129(M)	1,126,974 (M)	1,225,213(M)
Guaranty Trust Bank	44,717,688	23,330,656	1,300,820,647	2,086,810,070	Sterling Bank	8,317(M)	14,912(M)	618,732(M)	892,660(M)
Zenith Bank	189,358(M)	62,038(M)	2,239,472 (M)	3,486,887(M)	Stanbic Bank	248,909 (M)	1,056 (M)	535,170(M)	637,840(M)

Table 3.1 (B) Bank Key Performance Indicators (KPI): Highly digitalized v Less digitalized Bank.

Source: Generated by the Authors from Banks' (2010 – 2019) Annual Reports.

4.0 Analysis of data and discussion of findings

The data presented in Tables 4.1 (A) and (B) are further processed (see Tables 3.2 (a) (b) (c) and (d)) to compare percentage changes relation between the four banks' key performance index (KPI) across the four highly digitalized and the less digitalized banks via:

- Customer deposit,
- Loan and Advances to customers
- Asset Under management
- Bank operation expense

Table 4.2 presents the rate of (%) changes in customer deposits in a highly digitalized (Access Bank) with a less digitalized Stanbic ibtc bank. Fig 4.1 presents in graphical form the relationship between the rate (%) changes in the index in either bank. From the graph in Fig. 4.1, we observed no real significant difference between customer deposits in highly digitalized Access bank and the less digitalized Stanbic ibtc bank. We noticed though, between

2013 through 2014, customers deposits in Access Bank dipped negatively, Stanbic ibtc bank, a less digitalized bank stayed positively and above zero.

Table 4.2 Rate of Change (%)

Customer Deposits

	Rate of change (%): ±Customer Deposits: Acess Bank	Rate of change (%) ±Customer Deposits: Stanbic Bank
2010		
2011	15.70179936	20.11253612
2012	52.2294705	17.14399061
2013	10.12158412	18.87417378
2014	-19.3417230	-0.28731045
2015	33.26138053	13.66853558
2016	4.160919904	34.34646121
2017	9.976972626	7.171840211
2018	-5.32304121	-21.0293032
2019	32.23139021	-100

Table 4. 1 (a) GUARANTY TRUST BANK
Highly Digitalise Bank

Loan & Adv. to Customers ₦'000	Changes	Rate of change (%) ±
563,383,562	115,975,357	
679,358,919	63,078,025	17.0712938
742,436,944	184,530,149	8.496078423
926,967,093	255,426,781	19.9068716
1,182,393,874	82,813,569	21.60251221
1,265,207,443	152,010,509	6.545453827
1,417,217,952	-151,246,264	10.72597964
1,265,971,688	-197,972,669	-11.9470494
1,067,999,019	232,821,628	-18.5367837
1,300,820,647	-1,300,820,6	17.89805755

STERLING BANK
Less Digitalised Bank

Loan & Advances to customers ₦'000	Changes	Rate of change (%) ±
99,312,070		
159,734,616	60,422,546	37.826833
229,420,874	69,686,258	30.374855
321,743,748	92,322,874	28.694536
371,246,273	49,502,525	13.334147
338,726,271	-32,520,002	-9.600673
468,249,870	129,523,599	27.661214
598,073,000	129,823,130	21.706904
621,017,000	22,944,000	3.6945849
618,732,000	-2,285,000	-0.369304

Table 4.1 (b) ACCESS BANK
Highly Digitalise Bank

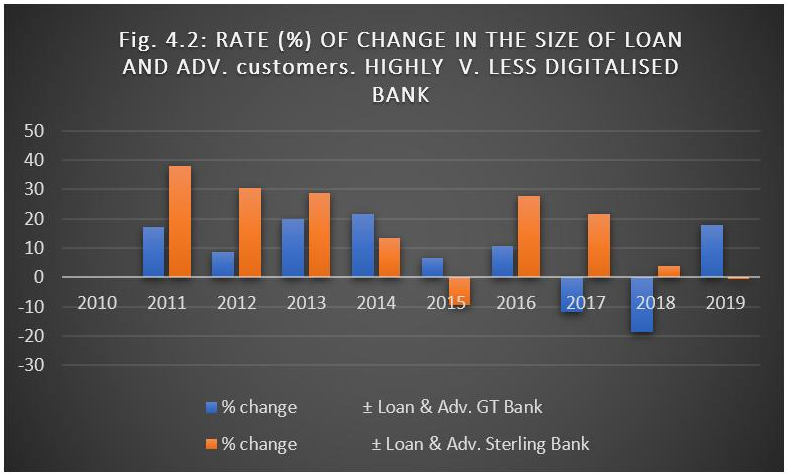
CUSTOMER DEPOSIT ₦ (M)	Changes	Rate of change (%) ±
440,542	82,058	
522,600	571,380	15.701799
1,093,979	123,198	52.229471
1,217,177	-197,26	10.121584
1,019,909	508,305	-19.34172
1,528,214	66,348	33.261381
1,594,562	176,720	4.1609199
1,771,283	-89,521	9.9769726
1,681,762	799,862	-5.323041
2,481,624	-2,481,6	32.23139

STANBIC BANK
Less Digitalised Bank

CUSTOMER DEPOSIT ₦ (M)	Changes	Rate of change (%) ±
187,595	108,310	
295,905	59,514	20.1125361
355,419	60,933	17.1439906
416,352	78,583	18.8741738
494,935	-1,4220	-0.28731045
493,513	67,456	13.6685356
560,969	192,673	34.3464612
753,642	54,050	7.17184021
807,692	-169,852	-21.0293032
637,840	-637,840	-100-100

Table 4.3 Rate of change (%) Loan & Advances to Customers

Year	% change ± Loan & Adv. GT Bank	% change ± Loan & Adv. Sterling Bank
2010		
2011	17.0712938	37.82683273
2012	8.49607842	30.37485508
2013	19.9068716	28.6945355
2014	21.6025122	13.33414733
2015	6.54545383	-9.60067311
2016	10.7259796	27.66121409
2017	-11.947049	21.70690367
2018	-18.536784	3.69458485
2019	17.8980575	-0.36930367



Source: Generated from Table 4.3

We analyzed, using the same rate (%) of change, in the size of loan and advances to customers in a highly digitalized Guaranty Trust bank and compared the result with the rate (%) of change in a less digitalized Sterling Bank. We tested for the disparity, in favour of Guaranty Trust Bank for a larger rate (%) of change in the size of loan and advances to customers as against a smaller volume of change in loan and advance in Sterling, a less digitalized bank. Our findings shown in the histogram in Fig. 4.2 generated from Table 4.3 is a paradox. Sterling bank, against our earlier conjecture, in all the years, except 2017 and 2018, granted higher level of loans and

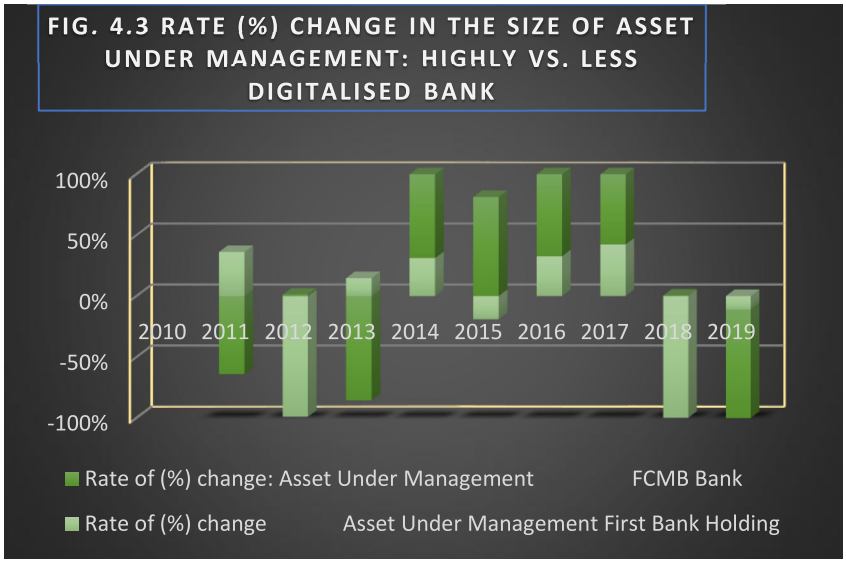
advances to customers than Guaranty Trust Bank a highly digitalized bank.

Similarly, we examined the (%) rate of change in the value of asset under management between First Bank Holdings a highly digitalized bank, compare to a less digitalized First City Monument Bank (FCMB). The (%) rate of change in the value of asset under management between these banks is represented on the Table 4.4 and further illustrated with the histogram in Figure 4.3 below. Our findings revealed a less digitalized First City Monument Bank (FCMB) having higher percentage rate of change of asset under management than a highly digitalized First Bank Holdings in all the years except, 2018 and partially 2019 when First Bank Holding is negative.

Table 4.4 Rate of change (%)

Asset under Management

	Rate of (%) change Asset Under Management First Bank Holding	Rate of (%) change: Asset Under Management FCMB Bank
2010		
2011	43.80269202	-77.2214867
2012	-28240.2677	326.0626196
2013	12.71910112	-74.6036946
2014	75.96673148	168.8103925
2015	-83.3630421	359.0065936
2016	78.49842433	161.4760026
2017	71.94939854	98.1398378
2018	-2342.74876	7.373312223
2019	-12.1033693	-100



Source: **Generated form Table 4.4**

4.1 Discussion of findings

In all three cases analyzed, the less digitalized banks representing normal banking firms outperformed the highly digitalized banks - the Fintech startup firms group. These findings support the two hypothesis stated in section 2.2 and proposed for this work. By these findings, we are of the opinion, the recent surge in digitalization in banking functions, services and product offerings are a vain effort, waste, and an unnecessary destruction of shareholder value. It added nothing significant to improving banking sector profitability as it was falsely propagated in banks' annual general meetings (AGM) and board rooms.

Moreover, our finding supports opinion in extant literature (**Agboola**, M.G et al 2014, **Dietz, et al.** 2016). Fintech startup firms are not able to out compete Nigeria deposit money banks neither in the Nigeria Financial service markets space nor in any other financial related market sectors. Fintech startup are no threat to the brick-and-mortar model. Banking is not about technological deployment which only enhance service and product offerings on the short run and little more thereafter. We are unable, though to outrightly deny the value chain additions due technological deployment: ATM, payment gateway, transfers etc. their contribution are only marginal. Despite ATM banking hall are still overcrowded said one Bank.

That our hypothesis is proven right is one thing. The disturbing issue though at discussion is to explain why the less digitalized banks outperformed the highly celebrated digitalized banks – the Fintech startups. One possible explanation could be that technological deployments in banking service offerings and functional units, except the payment gateway: (ATM, transfers and perhaps few others) does little or nothing improving cash flow to banks. The high incidence of technological deployment in commercial banking services, benefits the payment gateway where Fintech startup are also active due mainly to the financial exclusion prevalently experienced in many sub-Sahara African countries including Nigeria (see Appendix A for further details) but not revenue generation. Gateway payment cash flow receipts are tokens when compared to interest spread on loan and advance. It thus contributes marginally in revenue generation to banks.

It is also doubtful the extent of the contribution of information technology to banking services offerings. One banker once asked, "why is that banking halls are still overcrowded if technological deployment is of benefit."

5. Recommendation and conclusion

As McKinsey & Company (December 2020) in its recent Global Banking Annual Review, noted, to stay competitive, banks should reduce its cost-to-income ratio and not add on functions. It should improve its "productivity engine", that is, improve its capital management capabilities and re-build its risk-management muscles to stymie competition. From indications, Nigeria deposit money banks (DMB) may not sufficiently achieve cost savings enough to ward off the competition from Fintech startup firms only in a massive one off digital implementations programs. Rather, a mindset and capabilities: - reset third party spending, move to minimum viable central functions and dedicated to continuous improvement aimed at greater productivity and better customer experience could generate the needed resilience for deposit money banks (DMB) to stay competitive in the new global financial market.

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Appendix A

Table 1
FinTech infrastructure

Nation	Legal heritage	Electrical penetration	Internet penetration	Mobile phone penetration	Days to start a new business
Benin	Civil law	32%	33.1%	88.1%	9
Burkina Faso	Civil law	20%	18.8%	79.8%	13
Cameroon	Civil law	63%	24.8%	79.5%	17
Central African Rep.	Civil law	3%	5.4%	27.3%	22
Chad	Civil law	9%	5.0%	39.0%	60
Congo, Democ. Rep.	Civil law	15%	6.1%	49.5%	7
Congo, Rep. of	Civil law	43%	12.0%	104.4%	49
Côte d'Ivoire	Civil law	62%	26.3%	109.9%	7
Ethiopia	Civil law	45%	15.3%	42.4%	33
Gabon	Civil law	90%	47.7%	146.2%	33
Guinea	Civil law	20%	12.3%	89.5%	8
Madagascar	Civil law	23%	7.2%	44.1%	8
Mali	Civil law	41%	65.3%	129.9%	9
Mauritania	Civil law	31%	17.8%	87.5%	6
Mozambique	Civil law	29%	17.3%	71.9%	19
Niger	Civil law	11%	4.3%	45.0%	7
Rwanda	Civil law	30%	29,8%	75.3%	4
Senegal	Civil law	64%	59.8%	99.9%	6
South Sudan	Civil law	1%	17.3%	24.4%	13
Togo	Civil law	35%	11.3%	65.5%	6
Botswana	Common law	55%	39.6%	157.3%	48
Ghana	Common law	84%	34.3%	126.9%	14
Kenya	Common law	65%	85.0%	79.8%	25
Lesotho	Common law	34%	27.7%	98.4%	29
Liberia	Common law	12%	8.1%	81.2%	5
Malawi	Common law	11%	9.5%	37.4%	37
Mauritius	Common law	100%	63.4%	139.9%	6
Namibia	Common law	56%	30.8%	105.1%	66
Nigeria	Common law	61%	50.2%	83.2%	19
Sierra Leone	Common law	9%	11.7%	78.2%	11
South Africa	Common law	86%	53.7%	159.2%	45
Tanzania	Common law	33%	38.9%	73.6%	28
Uganda	Common law	19%	42.9%	50.4%	24
Zambia	Common law	34%	41.2%	71.8%	9
Zimbabwe	Common law	34%	40.2%	80.9%	61
9 Means	**Civil law**	**33.4%**	**21.8%**	**75.0%**	**17**
	Common law	**46.2%**	**38.5%**	**94.9%**	**28**
p-value difference in means		.15	.01	.10	-.6

Sources:www.internetworldstats.com;databank.worldbank.org;InternationalEnergy Agency(https://www.gogla.org/sites/default/files/resource_docs/ weo2017specialreport_energyaccessoutlook.pdf). In Yermack, D. (2018). Fintech in sub-Saharan Africa: what has worked well, and what Hasn't. Working Paper Series No.25007.

iii

Appendix B

	GUARANTY TRUST BANK Highly Digitalise Bank			STERLING BANK Less Digitalised Bank				ACCESS BANK Highly Digitalise Bank			STANBIC BANK Less Digitalised Bank		
Year	Loan & Adv. to Customers ₦' 000	Changes	% change ±	Loan & Advances to customers ₦'000	Changes	% change ±		CUSTOMER DEPOSIT ₦'000	Changes	% change ±	CUSTOMER DEPOSIT ₦'000	Changes	% change ±
2010	563,383,562	115,975,357		99,312,070				440,542	82,057		187,595	108,310	
2011	679,358,919	63,078,025	17.0712938	159,734,616	60,422,546	37.826833		522,599	571,380	15.701739	295,905	59,514	20.1125361
2012	742,436,944	184,530,149	8.49607842	229,420,874	69,686,258	30.374855		1,093,979	123,198	52.229505	355,419	60,933	17.1439906
2013	926,967,093	255,426,781	19.9068716	321,743,748	92,322,874	28.694536		1,217,177	-1,084,696	10.121584	416,352	78,583	18.8741738
2014	1,182,393,874	82,813,569	21.6025122	371,246,273	49,502,525	13.334147		132,481	1,395,733	-818.75844	494,935	-1,422	-0.28731045
2015	1,265,207,443	152,010,509	6.54545383	338,726,271	-32,520,002	-9.600673		1,528,214	284,829	91.331016	493,513	67,456	13.6685356
2016	1,417,217,952	-151,246,264	10.7259796	468,249,870	129,523,599	27.661214		1,813,043	97,731	15.709997	560,969	192,673	34.3464612
2017	1,265,971,688	-197,972,669	-11.947049	598,073,000	129,823,130	21.706904		1,910,774	147,965	5.1147261	753,642	54,050	7.17184021
2018	1,067,999,019	232,821,628	-18.536784	621,017,000	22,944,000	3.6945849		2,058,739	1,609,601	7.1871773	807,692	-169,852	-21.0293032
2019	1,300,820,647	-1,300,820,647	17.8980575	618,732,000	-2,285,000	-0.369304		3,668,340	-3,668,340	43.878184	637,840	-637,840	-100