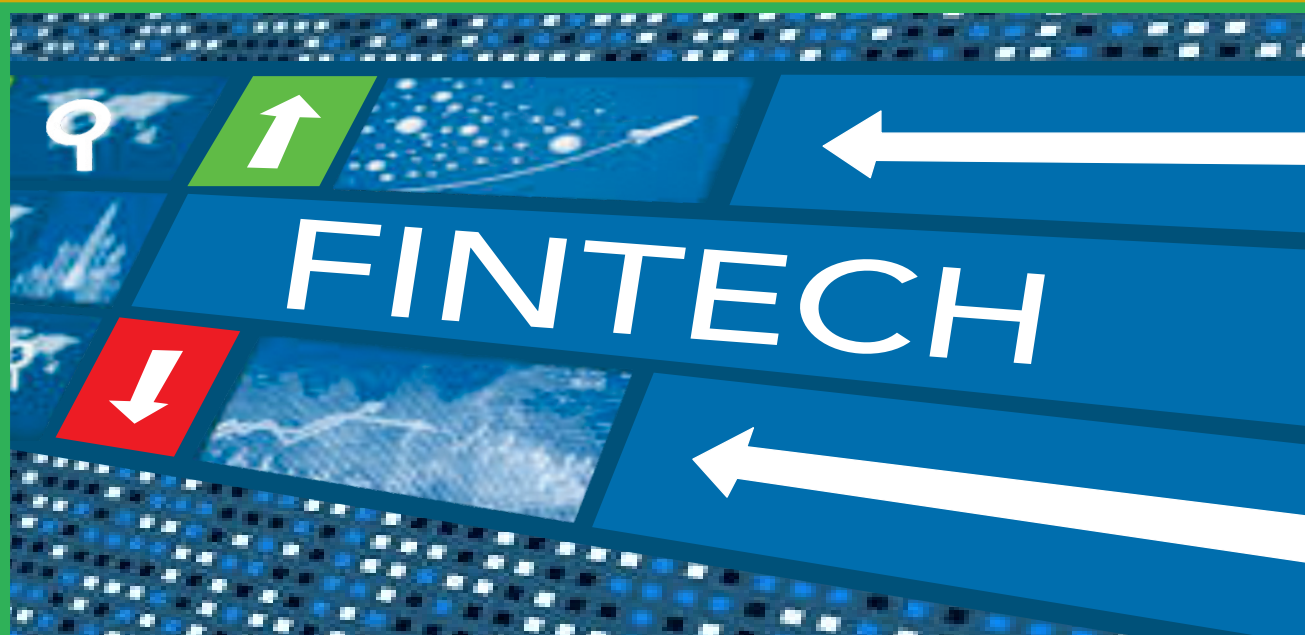




# BULLION

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## CALL FOR ARTICLES IN THE BULLION THEMATIZED EDITION

The Editorial Board is pleased to announce that our first quarter 2023 Bullion will be a Thematized/Special edition. Consequently, we invite original articles of high quality on the Theme: Rising Global Inflation and the Nigerian Economy.

The Board has also outlined the following sub-themes as expected areas of concentration for authors:

- a. Inflation and Cost of living crisis
- b. Fiscal Policy and inflation
- c. Inflation Pass-through Effects
- d. Inflation Control measures: Effectiveness and Policy issues, etc.
- e. Revisiting the exchange rate pass-through to domestic inflation in Nigeria
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- k. Nigeria's policy choices in the context of rising global inflation
- l. Threshold Inflation effect and economic growth
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Please note that entries are not limited to the sub-themes above.

### Structure

Papers should be compiled in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; declaration of interest statement; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list).

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## Modeling Continued Usage Intention of Mobile Banking Applications Among University Students



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### Abstract

*This study investigated how customer satisfaction and continued usage intention are influenced by mobile banking application (MB app) adoption among Nigerian university students. The study also examined the mediating role of satisfaction on the relationship between MB app adoptions and continued usage intention among Nigerian University students. Data were generated from an electronically filled questionnaire and submitted by 516 University students. However, 475 responses were found to be valid and were used for data analyses. Data obtained were descriptively analysed. Confirmatory factor analysis was then conducted. Analysis of Moment Structures (AMOS) software was used to estimate the model using the structural equation modeling technique. The study found that perceived usefulness and perceived credibility positively and significantly impact customer satisfaction and their continued usage intention. However, customer satisfaction and continued usage intention were not significantly impacted by perceived ease of use and social influence. The findings imply that banking service*

*providers must strategise to enhance the perceived effectiveness and level of credibility associated with their MB apps. It is recommended that banks continuously review and update their mobile apps to meet the dynamic needs of their undergraduate student customers, since they are a unique market segment for their financial services.*

**Keywords:** Banks, MB apps, Perceived Credibility, Perceived Usefulness, Satisfaction, Technology.

### 1.0 INTRODUCTION

Over the last few decades, several drivers have revolutionised the mode of operations in most industries, including the banking sector. For instance, the recent COVID-19 pandemic and the associated lockdown and other restrictions aimed at containing the Pandemic resulted in the widespread industry adoption of the online mode of operations, whether for buying and selling or working from home (El-Erian, 2020; Sheth, 2020). Of the various drivers, rapid technological advancement has remained the most consistent factor responsible for redefining the industry-wide mode of operations (Braidbacht et al., 2018; Nisha et al., 2015; Awadhi, 2013; Jeong & Yoon, 2013; Riquelme & Rios, 2010).

Due to technological advancement, the contactless mode of operations is now the norm in several industries, including the banking sector (Agwu & Adele-Louise, 2014). Therefore, unlike in the past, where customers had to physically visit the banking halls of financial institutions to enjoy their service. Banks today are leveraging Information and Communication Technology (ICT) to remotely deliver world-class services to their customers at all times of the day (Priya et al., 2018; Nisha et al., 2015; Saleem & Rashid, 2011). The application of ICT in the banking sector has resulted in the evolution of innovative financial service delivery platforms like Smart cards (Debit or Credit), internet banking, automated teller machines (ATMs), USSD, and even mobile banking. With these platforms, it is now possible for customers to access financial and banking services through different platforms anytime and

anywhere (Sulaiman et al., 2007; Awadhi, 2013, Nisha et al., 2015).

Given the popularity of mobile phones, the possibility of using mobile technology in commercial activities gave rise to mobile commerce (m-commerce). As an offshoot of e-commerce, Mobile Banking (MB) enables financial institutions to deliver financial services to their customers using mobile phones or app(s) on mobile phones (Priya et al., 2018; Nisha et al., 2015). Hence with MB, customers can carry out financial transactions at any time and from any location using a mobile device (Bankole et al., 2011).

According to Priya et al. (2016), financial transactions that can be carried out using MB may be broadly categorised into brokerage, accounting, and information services. Examples of these activities include bill payment, fund transfer, and quick loans. At the onset, MB was only available through SMS (short message service); however, with the development of Smartphones and Wireless Application Protocol (WAP) enabled service, European banks began offering financial services to their customers using WAP.

As wireless technology continues to improve, from 3G to the present 5G, financial and banking institutions have continued to develop better and more efficient ways to serve their customers (Muñoz-Leiva, Climent-Climent & Liébana-Cabanillas, 2017). According to Priya et al. (2018), banks have not only employed MB in pursuit of better customer experience but have also done so to reduce the cost associated with their operations. In Africa, for instance, and Nigeria in particular, banks and other financial institutions have been able to enhance customer satisfaction, effectively handle complaints, reduce operational, labour, and infrastructural costs as well as expand their geographical reach through mobile banking (Isibor & Agbadudu, 2020; Alalwan et al., 2015).

Despite the several benefits that MB offers, its

adoption rate has been reported to be relatively low globally, especially in sub-Saharan Africa (Alalwan et al., 2015; Riquelme & Rios, 2010). Some reasons for this low adoption rate have been adduced including its associated perceived risk and poor telecom infrastructure in some areas. Similarly, aged bank customers are unwilling to relearn or acquire new knowledge because they prefer traditional banking methods (Adjaino et al., 2018). Therefore, to enhance MB adoption rates, banks have often targeted younger and more educated customers, like university students, since they are better informed and open to innovation (Evbayiro-Osagie et al., 2017; Khaitbaeva et al., 2014).

Furthermore, since customers in the university students' financial market segment are often first-time account holders, targeting them could prove strategic for banks. It is because if adequately nurtured, university students could become profitable clients for banks in the future (Hinson et al., 2011). For banks to develop MB strategies that will effectively attract and retain these young customers, there is a need to understand the impact of MB app adoption. In terms of perceived usefulness, perceived ease of use, perceived credibility, and social influence on continued usage intention and how such relationships could be mediated by customer satisfaction. This study contributes to this understanding by setting and achieving the following objectives.

- i. To determine the impact of MB app adoption (perceived usefulness, perceived ease of use, perceived credibility, and social influence) on the satisfaction of university students.
- ii. To ascertain the impact of MB app adoption (perceived usefulness, perceived ease of use, perceived credibility, and social influence) on continued usage intention among university students.
- iii. To examine the mediating role of

satisfaction on the relationship between MB app adoption and continued usage intention among university students.

Accordingly, this paper is divided into six parts. The first part introduces the subject matter while the second part contains a review of extant literature. The methodology is discussed in part three while part four contains the results and the discussions of the research outcomes. The fifth part contains the conclusion and policy implications. The last part contains the research limitations and suggestions for future studies.

## 2.0 LITERATURE REVIEW

### 2.1 Conceptualising Mobile Banking App

Mobile banking or MB is popularly referred to as a subset of electronic banking (Agami& Du, 2017). It is any form of banking transaction that is carried out with the aid of mobile devices like smartphones (Koksal, 2016). As a technological innovation, MB enables consumers to enjoy banking and other financial services virtually at any place or time (Akpan, 2009; Suoranta&Mattila, 2004). Mobile banking services could be web and app-based or SMS (short message services) based (Agami& Du, 2017). Since its advent in the 1990s, the range of services MB offers has continued to evolve and expand.

More banking customers are embracing the use of MB apps in transactions because of the transforming customer experience the apps offer. Most apps are characterised by an interactive interface that can easily be navigated. Other attributes and benefits of MB apps include personalisation, friendly customer service options, instant alerts and notification, relatively secured sign-in features, availability of digital payment options, and provision of a personalised account management page, among others (Munoz-Leiva et al., 2017).

These MB apps and other MB services offer financial institutions and customers several

benefits. MB has enabled banks to reduce costs (whether financial or operational), widen coverage, and enhance efficiency. It has translated into better financial performance, especially in terms of the level of profitability. On the side of customers, MB has enhanced convenience, availability, time-saving, and security. On the side of customers, MB adoption has improved the level of security, customer convenience, and accessibility to financial services (Agami& Du, 2017).

### 2.2 Mobile Banking App and Adoption Theories

This refers to the pace at which bank customers employ the MB alternative in financial transactions. Despite the benefits associated with MB, its adoption rate has been reported as low in both developed and developing countries (Low et al., 2017; Priya et al., 2018; Oluwabusayo, 2013). Concerning adopting innovation, Kotler and Keller (2011) opined that consumers go through several stages from "awareness", "interest", and "evaluation" to "trial" before the "adoption" stage. Based on the ease and readiness with which consumers adopt an innovation, Kotler and Keller (2011) categorised consumers as "Innovators", "Early Adopters", "Early Majority", "Late Majority", and "Laggards".

Given this difference, several proposed theories seek to explain why consumers respond to innovation differently. Some of these theories include the: "Diffusion of Innovation Theory" (Rogers, 2003), the Technology Acceptance Model (Davis, 1989) and the "Unified Theory of Acceptance and Use of Technology" (Venkatesh et al., 2003). The Technology Acceptance Model (TAM) is the most common model researchers use for explaining adoption behaviour. As such, the model has several extensions (Munoz-Leiva et al., 2017).

According to the original TAM model, a

consumer's decision on whether or not to adopt an innovation is based on the "ease of use". Also, the new technology's level of "usefulness" or "relative advantage". Venkatesh and Davis (1996) proposed TAM 2 by adding "social influence" and "cognitive factor" as additional dimensions that determine the pace of innovation adoption. Venkatesh and Bala (2008) added the dimension of TAM 1 and 2 to form TAM 3. Some other factors that have been proposed for explaining consumer adoption behaviour include: "demography" ("Perceived fun" (Igbaria et al., 1994), "performance expectancy", "voluntariness of use", "effort expectancy", and "demography" (Venkatesh et al., 2003), while Bouten identified "compatibility" in 2008. Of these factors, this study explores the implications of Perceived usefulness, Perceived ease of use, Perceived credibility, and social influence on the MB continued usage intention of university students. Furthermore, this study examines how satisfaction moderates the relationship between MB continued usage intention and the selected independent variables.

### 2.3 Perceived Usefulness

Also often referred to as relative advantage, perceived usefulness has been defined as "the degree to which a person believes that using a specific system will increase his or her job performance" (Davis, 1989: 985). As Foroughi et al., (2019) explain, perceived usefulness refers to individual perception of the improvement in the quality of service received as a result of using a specific technology. Concerning mobile banking, perceived usefulness refers to the extent consumers believe adopting the MB option would increase their productivity. Research suggests that consumers are usually more willing to adopt MB because it saves them costs in terms of time and effort when compared to "brick and mortar" banking (Jeong & Yoon, 2013). As Kumar et al., (2018) and Lim et al., (2021) found, users' satisfaction with MB is positively and significantly influenced by perceived usefulness.

Similarly, Shaikh and Karjaluoto (2015) found that the perceived usefulness of the services mainly determines individuals' attitudes and intention to use MB services. It, therefore, implies that the greater the perceived effectiveness of the MB app, the greater the likelihood of its continuous usage. Thus, we propose that:

H<sub>1a</sub>: There is a significant relationship between perceived usefulness and satisfaction among university students.

H<sub>2a</sub>: There is a significant relationship between perceived usefulness and MB continued usage intention among university students.

### 2.4 Perceived Ease of Use

In proposing TAM, Davis (1989:985) defined perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort within an organisational context". Foroughi et al. (2019) described it as "an assessment of the degree to which an individual believes that using a specific technology would be free of mental effort." Mobile technology, when easy to use, is less threatening to consumers and hence quickly adopted and vice versa. However, adoption is slower, where technology adoption requires substantial learning and adjustment on the part of a consumer (Priya et al., 2018).

Foroughi et al. (2019) found a negative and statistically insignificant relationship exists between perceived ease of use and customer satisfaction with MB. Munoz-Leiva et al., (2017) and Shaikh and Karjaluoto (2015) showed that attitude towards m-banking services is positively influenced by perceived ease of use. Therefore, customer satisfaction and MB continued usage are expected to be positively influenced by perceived ease of use. We, therefore, hypothesise that:

H<sub>1b</sub>: There is a significant relationship between perceived ease of use and satisfaction among university students.

H<sub>2b</sub>: There is a significant relationship between perceived ease of use and MB continued usage intention among university students.



## 2.5 Perceived Credibility

This is also often referred to as trust. It refers to the extent to which consumers believe "that mobile banking is free from security and privacy concerns" (Wang et al., 2003: 514). With cases of internet fraud on the rise, consumers are only keen on adopting MB if they perceive it as trustworthy. Consumers are also concerned about the probability of transactions failing and the loss/disclosure of sensitive personal information (Priya et al., 2018). Sahoo and Pillai (2017) found that the MB app's credibility mainly determines customer satisfaction with online transactions. Credible MB platforms are expected to enhance customer satisfaction and their usage intention. Consumers' perception of the ability of MB platforms to deliver reliably and securely has been found to determine the rate of adoption, satisfaction, and usage intention. Therefore, the perceived credibility of MB apps is expected to impact customer satisfaction and usage intention positively. Thus, we hypothesise that:

H<sub>1c</sub>: There is a significant relationship between perceived credibility and satisfaction among university students.

H<sub>2c</sub>: There is a significant relationship between perceived credibility and MB continued usage intention among university students.

## 2.6 Social influence

Following Ajzen's (1991) "theory of planned behaviour", social influence is often captured as a subjective norm in several studies (Isibor & Odia, 2021; Schiffman & Kanuk, 2010). It describes the effect that the opinion of friends, acquaintances, family, superiors, colleagues and others have on a consumer's intention to engage or not to engage in a given behaviour. Concerning MB, while some studies suggest that MB adoption is influenced by social factors (Akturan & Tezcan, 2012), others suggest otherwise (Bankole et al., 2011). Patel (2016) and Farah et al. (2019) found that social influence plays a significant role in users' satisfaction with MB. We hypothesise that:

H<sub>1d</sub>: There is a significant relationship between

perceived credibility and satisfaction among university students.

H<sub>2d</sub>: There is a significant relationship between perceived credibility and MB continued usage intention among university students.

## 2.7 Customer satisfaction

The importance of customer satisfaction in any context has long been established in marketing literature. As Loh et al., (2022) described, satisfaction occurs when a service delivery's actual outcome exceeds users' expectations. It has been "rationalised as a person's emotion of contentment or disappointment as a result of comparison of his expectations to an experience" (Arslan et al., 2015:45). The rationale for pursuing customer satisfaction arises from the several benefits it offers to both the consumer and the firm. From the firm's perspective, loyalty, repeat purchase, and patronage intention are higher among satisfied customers. Satisfied customers are also likely to "spread positive word-of-mouth" about a provider (Isibor & Odia, 2020). Customer satisfaction has been found to determine and mediate usage or adoption intention in diverse contexts (Priya et al., 2018).

Thus, we seek to test the hypothesis that:

H<sub>2e</sub>: There is a significant relationship between satisfaction and MB continued usage intention among university students.

H<sub>3</sub>: Satisfaction mediates the relationship between MB app adoption and continued usage intention among University students.

## 3.0 METHODOLOGY

Quantitative research was carried out to investigate how the adoption of MB app influences customer satisfaction and their continued usage intention. As Nayak and Singh (2021) observed, quantitative research involves numerical data collection for describing a phenomenon that can be analysed statistically and mathematically. Quantitative research is chosen because it is well suited for the objectives of this study, is flexible in conducting statistical analyses,

and confirms an instrument's reliability. The population of the study is made up of undergraduate students of the University of Benin, Nigeria. Convenience sampling was used in collecting 516 responses, out of which 475 were valid and used for analyses. Therefore, the study's sample size is 475 valid responses used for data analyses.

Data for the study was collected using a questionnaire designed, administered, and retrieved electronically using Google Form (<https://forms.gle/vVxFdsd7RiFAzN5T8>). The questionnaire was sectionalised into two parts. The first part contains the respondents' demographic profile, including gender, age, and MB app usage experience. The variables in the second part are perceived usefulness, perceived ease of use, perceived credibility, social influence, satisfaction, and continued usage intention. The items were structured in a 5-point Likert scale format ranging from "Strongly Agree" to "Strongly Disagree". The items were adapted from previous studies conducted by Farah et al., (2018), Foroughiet al. (2019), Poromatikulet al., (2019), and Priyaet al. (2018) (See Table 2 for details). The link to the instrument was sent via Whatsapp to students in different departments at the University of Benin through their course or class representatives.

The researchers appealed to the course representatives to encourage the students to sincerely and voluntarily fill out the questionnaire. After three weeks (from 23/08/2021 to 12/09/2021), 516 responses were received. To ensure that the respondents that filled the questionnaire have used the MB app before, the researchers included a dichotomous question with a "Yes" or "No" option in the first part of the questionnaire, which reads: "Have you used MB

app before?". Eighteen of the respondents selected "No".

The 18 responses from these respondents were deleted. Twenty-three out of the remaining 498 responses were also deleted during the data screening stage due to perceived respondents' misconduct in selecting the same options for all the items suggesting that the respondents may not have read the questions before answering them. The final analyses were based on the remaining 475 responses.

Data collected were descriptively and inferentially analysed. Descriptive statistics such as mean and standard deviation were used to describe the items used in measuring the different constructs. Structural equation modeling (SEM) was used as an estimation technique. The justification for using SEM is that it allows simultaneous estimations of various independent variables on more than one dependent variable (Adekunle&Dakare, 2020; Collier, 2020). As further argued by Collier (2020:

1), SEM is "capable of testing an entire model instead of just focusing on individual relationships." SEM involves estimating both measurement and structural models. In this study, the influence of the predictor variables, namely: perceived usefulness, perceived ease of use, perceived credibility, and social influence on satisfaction and continued usage intention, were simultaneously estimated using covariance-based SEM (CB-SEM) in AMOS software.

The advantages of CB-SEM include the ability to perform confirmatory factor analyses (CFA) and display model fit statistics of the estimated model, which can be used to improve the model before the final estimation is done (Collier, 2020; Ronkko et al., 2016).

#### 4.0 RESULTS AND DISCUSSION

Description of respondents' bio-data

Table 1 contains the bio-data of the respondents that validly completed the questionnaire.

Table 1: Respondents' demographic bio-data

Variable	Category	Frequency	Percent	Cumulative Percent
Gender	Female	269	56.6	56.6
	Male	206	43.4	100.0
	Total	475	100.0	
Age (Years)	Below 20	137	28.8	28.8
	20-25	298	62.7	91.6
	26 -30	25	5.3	96.8
	31-35	7	1.5	98.3
	36 & Above	8	1.7	100.0
	Total	475	100.0	
Usage Experience (Years)	Below 1	169	35.6	35.6
	1-3	229	48.2	83.8
	4-6	66	13.9	97.7
	Above 6	11	2.3	100.0
	Total	475	100.0	

Source: Researchers' computation(2022)

As shown in Table 1, 269 (56.6%) of the respondents were female, while the male respondents were 206, representing 43.4% of the total respondents. It shows that majority of the respondents were female. However, the margin between males and females is not wide. Two hundred and ninety-eight respondents were between 20 to 25years, representing 62.7% of the total respondents. This is followed by 137 respondents that were below 20 years, accounting for 28.8%.

The remaining respondents (26years and above) jointly accounted for 8.5%. This is not surprising because the target population, which is the undergraduate students of the University of Benin, is predominantly young people. Table 1 further showed that 229 (48.2%) of the respondents had used MB apps for 1 to 3 years, while 169 (35.6%) had used the apps for less than a year. Sixty-six (13.9%) of the respondents have used MB apps for 4 to 6years. Only 11 (2.3%) of the respondents have used MB apps for over 6 years.

It can be deduced from the analyses that respondents' usage experience qualifies them to provide reliable answers to the items in the instrument administered to them.

#### 4.1 Preliminary data analysis

The quality of research outcomes depends on the quality of data collected and the kind of analysis performed. Hence, there was a need for data screening to delete responses that could result in spurious results. Data obtained were carefully screened to comply with and satisfy the assumptions of SEM. First, the normality test was conducted using skewness and kurtosis. The absolute values of skewness that ranged from 1.019 to 2.069 satisfied Kline's (2011) benchmark of skewness score of less than or equal to 3.

Similarly, the absolute values of kurtosis that ranged between 1.301 and 4.01 were below the cut-off stipulated by Kline (2011). Based on these results, it is concluded that the dataset used for analysis was normally distributed. Second, the dataset also satisfied the SEM assumption of having the dependent variable on a continuous scale. Third, SEM assumes a complete dataset. No missing data was used in the dataset because all the items were validly responded to. Finally, a sample size of 475 is considered to be adequate because Garver and Mentzer (1999) stipulated that a "sample size of 200 provides stable parameter estimates and has sufficient power to test a model".

### 4.2 Measurement Model

The measurement model involves computing the validity and reliability scores of the constructs as well as carrying out confirmatory factor analysis (CFA).

Table 2: Item statistics, standardised estimates, validity, and reliability scores

Variable & Scale Source	Indicator	Mean (SD)	Standardised Estimates	t-value	C.R.	AVE	Cronbach Alpha
Perceived Usefulness (Priyaet al., 2018)	PU1	4.39 (0.992)	0.885	***	0.933	0.561	0.931
	PU2	4.43 (0.981)	0.844	25.609			
	PU3	4.34 (1.004)	0.869	27.225			
	PU4	4.17 (1.019)	0.720	19.295			
	PU5	4.30 (1.002)	0.799	23.034			
	PU6	4.41 (1.003)	0.891	28.753			
Perceived Ease of Use (Priyaet al., 2018)	PE1	4.39 (0.978)	0.811	***	0.901	0.690	0.905
	PE2	4.43 (0.968)	0.893	23.891			
	PE3	4.16 (1.043)	0.787	19.825			
	PE4	4.08 (0.998)	0.739	18.178			
	PE5	4.14 (0.996)	0.726	17.761			
	PE6	3.95 (1.020)	0.696	16.818			
Trust (Foroughiet al., 2019),	PC1	4.22 (0.960)	0.872	***	0.846	0.767	0.857
	PC2	4.02 (0.985)	0.789	20.795			
	PC3	4.08 (0.978)	0.750	19.244			
Social Influence (Farah et al., 2018)	SI1	2.50 (1.391)	0.775	***	0.793	0.663	0.789
	SI2	2.12 (1.346)	0.813	13.515			
	SI4	2.58 (1.448)	0.654	12.606			
Satisfaction (Foroughiet al., 2019)	SA1	4.22 (1.047)	0.844	***	0.943	0.610	0.941
	SA2	4.13 (1.017)	0.831	22.870			
	SA3	4.18 (1.005)	0.901	26.415			
	SA4	4.22 (0.944)	0.910	26.868			
	SA5	4.13 (1.0010)	0.889	25.766			
Continued usage Intention (Foroughiet al., 2019; Poromatikul et al., 2019)	CU1	4.04 (1.052)	0.849	***	0.927	0.697	0.929
	CU2	4.12 (1.006)	0.874	25.004			
	CU3	4.01 (1.016)	0.859	24.211			
	CU4	4.03 (1.000)	0.807	21.795			
	CU5	4.12 (1.048)	0.753	19.576			
	CU6	4.19 (1.023)	0.800	21.492			

Model Fit Statistics

CMIN ( $\chi^2$ ) = 970.070, df = 362, CMIN/df = 2.680, p = 0.000, NFI = 0.921, RFI = 0.11, IFI = 0.949, TLI = 0.943, CFI = 0.949, RMSEA = 0.060

Note: SD = Standard deviation, CR = Composite reliability, AVE = Average variance extracted

Source: Researchers' computation (2022)

### 4.3 Validity and reliability of the instrument

In establishing the instrument's validity, convergence validity was carried out using Average Variance Extracted (AVE). As Fornell and Larcker (1981) stipulated, to establish an instrument's convergence validity, the AVE of each construct must exceed 0.5. The AVE of the constructs: perceived usefulness, perceived ease of use, perceived credibility, social influence,

satisfaction, and continued usage intention are: 0.561, 0.690, 0.767, 0.663, 0.610, and 0.720, respectively. It shows that the constructs satisfied the condition of having an AVE of above 0.5.

The reliability of the instrument was determined via composite reliability (CR) and Cronbach's alpha test. Hair et al., (2010) suggested that the recommended threshold for CR is 0.7, while Ab-

Hamid et al., (2017) suggested that a CR of 0.6 is acceptable. The CR of all the constructs is greater than 0.7, as shown in Table 2. Based on Nunnally and Berstein's (1994) benchmark of 0.7, all the constructs satisfied Cronbach's alpha condition as the values ranged between 0.789 and 0.931.

**4.4 Confirmatory Factor Analysis**

As shown in Table 2, the standardised factor loading or estimates of the indicators on the various constructs were all greater than 0.7, as

Collier (2020) suggested. Except for PE6 and SI4 with standardised estimates of 0.696 and 0.654, respectively. These indicators were retained in line with Collier's (2020) suggestion of not deleting indicators whose loadings are not less than 0.6.

The overall goodness of fit of the model was evaluated using the model fit statistics such as CMIN/DF (2.680), RMR (0.068), NFI (0.921), RFI (0.911), IFI (0.949), TLI (0.943), CFI (0.949), and RMSEA (0.060). The results showed that all the scores were within the acceptable range.

**4.4.1 Structural Model**

This section contains the outcome of the estimated model. The results are shown in Table 3 below:

Table 3: Structural model results and test of hypotheses

Path	Standardised Estimate	t-value	p-value	Hypothesis Testing
H <sub>1a</sub> : PUB → SAT	0.513	2.903	0.004	Supported
H <sub>1b</sub> : PEB → SAT	-0.139	-0.615	0.539	Not Supported
H <sub>1c</sub> : PCB → SAT	0.514	4.952	0.000	Supported
H <sub>1d</sub> : SIB → SAT	0.053	1.508	0.131	Not Supported
H <sub>2a</sub> : PUB → CUI	0.322	1.990	0.047	Supported
H <sub>2b</sub> : PEB → CUI	-0.188	-0.952	0.341	Not Supported
H <sub>2c</sub> : PCB → CUI	0.195	1.995	0.046	Supported
H <sub>2d</sub> : SIB → CUI	0.038	1.224	0.221	Not Supported
H <sub>2e</sub> : SAT → CUI	0.614	9.890	0.000	Supported

Squared Multiple Correlation (R<sup>2</sup>)

Satisfaction = 0.712; Continued Usage Intention = 0.796

Model Fit Statistics

CMIN ( $\chi^2$ ) = 970.070, df = 362, CMIN/df = 2.680, p = 0.000, NFI = 0.921, RFI = 0.11, IFI = 0.949, TLI = 0.943, CFI = 0.949, RMSEA = 0.060

Note: Perceived usefulness (PUB), Perceived ease of use (PEB), Perceived Credibility (PCB), Social influence (SIB), Satisfaction (SAT), & Continued usage intention (CUI).

Source: Researchers' computation (2022)

**4.4.2 Estimation of MB app adoption and satisfaction among students**

Table 3 shows the effect of MB app adoption proxied by perceived usefulness, perceived ease of use, perceived credibility, and social influence on satisfaction. The results showed that satisfaction with MB app is positively and significantly influenced by perceived usefulness ( $\beta = 0.513$ ,  $t = 2.903$ ), and perceived credibility ( $\beta = 0.514$ ,  $t = 4.952$ ). Though the relationship between social influence ( $\beta = 0.053$ ,  $t = 1.508$ ) and satisfaction is positive, it is not significant. The

relationship between perceived ease of use ( $\beta = -0.139$ ,  $t = -0.615$ ) and satisfaction is negative and statistically insignificant. The squared multiple correlation, otherwise known as R<sup>2</sup> is 0.712. It implies that the predictor variables jointly explain 71.2% of students' satisfaction with the MB app.

**4.4.3 Estimation of MB app adoption and continued usage intention among students**

Table 3 also shows the effect of MB app adoption on students' continued usage intention. The results showed that continued usage intention is positively and significantly influenced by

perceived usefulness ( $\beta = 0.322, t = 1.990$ ), perceived credibility ( $\beta = 0.195, t = 1.995$ ), and satisfaction ( $\beta = 0.614, t = 9.890$ ). The relationship between social influence ( $\beta = 0.038, t = 1.224$ ) and continued usage intention is positive but not significant. However, perceived ease of use ( $\beta = -0.188, t = -0.952$ ) has a negative and statistically insignificant relationship with continued usage intention. The  $R^2$  is 0.796, implying that the predictor variables jointly explain 79.6% of continued usage intention.

The overall goodness of fit of the structural model was evaluated using the model fit statistics such as

CMIN/DF (2.680), RMR (0.068), NFI (0.921), RFI (0.911), IFI (0.949), TLI (0.943), CFI (0.949), and RMSEA (0.060). The results showed that all the scores were within the acceptable range.

#### 4.4.4 Estimation of mediating role of satisfaction on MB app adoption and continued usage intention

Hypothesis 3 in the study seeks to test the mediating role of satisfaction on the relationship between MB app adoption and continued usage intention. This was achieved by using the bootstrapping approach to test for mediation in the relationships. The results are presented in Table 4:

Table 4: Test for mediation using a bootstrapping approach

Relationships	Direct Effect	Indirect Effect	Confidence Interval		P-value	Conclusion
			Lower	Upper		
PUB → SAT → CUI	0.238 (4.836)	0.354	0.056	0.770	0.021	Partial Mediation (Complementary)
PEB → SAT → CUI	0.268 (4.801)	-0.172	-0.729	0.288	0.498	No Mediation
PCB → SAT → CUI	0.275 (4.594)	0.359	0.220	0.560	0.000	Partial Mediation (Complementary)
SIB → SAT → CUI	-0.004 (-0.146)	0.042	-0.015	0.103	0.143	No Mediation

Note: Perceived usefulness (PUB), Perceived ease of use (PEB), Perceived Credibility (PCB), Social influence (SIB), Satisfaction (SAT), & Continued usage intention (CUI).

Source: Researchers' computation (2022)

Table 4 revealed a positive and significant indirect effect of satisfaction ( $\beta = 0.354, p < 0.05$ ) on the relationship between perceived usefulness and continued usage intention. The result also established the positive and significant relationship of the direct effect of perceived usefulness on continued usage intention in the presence of the mediator ( $\beta = 0.238, t = 4.836$ ). Therefore, satisfaction partially mediated the relationship between perceived usefulness and continued usage intention. Similarly, Table 4 also revealed a positive and significant indirect effect of satisfaction ( $\beta = 0.220, p < 0.05$ ) on the relationship between perceived credibility and continued usage intention. The result also established the positive and significant

relationship of the direct effect of perceived credibility on continued usage intention in the presence of the mediator ( $\beta = 0.275, t = 4.594$ ). Therefore, satisfaction partially mediated the relationship between perceived credibility and continued usage intention. The mediation is complementary as the sign of coefficients for both direct and indirect effects are the same (positive).

Finally, the indirect effects of satisfaction on perceived ease of use ( $\beta = -0.172, p > 0.05$ ) on CUI as well as a social influence ( $\beta = 0.042, p > 0.05$ ) on CUI are not statistically significant as the p-values are greater than 5.0 per cent. Therefore, satisfaction does not mediate the relationships.

#### 4.4.5 Discussions

Firstly, this study found that customer satisfaction and continued usage intention are positively and significantly influenced by the perceived usefulness of mobile banking app. This implies that the more bank customers perceived a bank's MB app as useful, the more satisfied they would be with the app. Similarly, the greater customers' perceived a bank's MB app as being useful, the greater the likelihood that such bank customers would continue to use the app in the future. These findings are supported by the outcomes of Kumar et al. (2018) and Lim et al. (2021) that found users' satisfaction with MB to be positively and significantly influenced by perceived usefulness. Loh et al. (2022), in a study on the relationship between mobile payment continued intention and cognitive-affective, found that satisfaction has a positive and significant influence on continued intention. Al-Sharafiet al., (2021, p. 1075) also supported the research finding that "the higher the usefulness of mobile payment contactless technologies, the higher the users' satisfaction will be". As scholars such as Jeong and Yoon (2013) found, consumers are usually more willing to adopt MB because it saves them costs in terms of time and effort when compared to "brick and mortar" banking. It was further corroborated by Shaikh and Karjaluo (2015), that found individuals' attitudes and intentions to use MB services to be mainly determined by the perceived usefulness of the services.

Secondly, it was found that perceived ease of use of mobile banking apps has a negative and insignificant influence on customer satisfaction and continued usage intention. According to Priya et al., (2018), adoption is slower where technology adoption requires substantial learning and adjustment on the part of a consumer. Hence, it is often assumed that when mobile technology is easy to use, it is less threatening to consumers and quickly adopted and vice versa. The results suggest that with these categories of bank customers (University students), perceived ease of

MB app use does not significantly affect customer satisfaction or their intention to continue using MB apps. It may not be unconnected with the fact that Undergraduate students are often "tech-savvy" (Okhawere&Isibor, 2021). Unlike older customers, students are more open to innovation and find it easy to learn about and use mobile banking apps.

The outcome of this study is similar to the finding of Foughiet al., (2019), which revealed a negative and statistically insignificant relationship between perceived ease of use and customer satisfaction with MB. However, Munoz-Leiva et al., (2017) and Shaikh and Karjaluo (2015) showed that attitude toward m-banking services is positively influenced by perceived ease of use.

Thirdly, this study found that customer satisfaction and continued usage intention are positively and significantly influenced by the perceived credibility of the MB app. This finding is supported by Sahoo and Pillai's (2017) argument that the MB app's credibility mainly determines customer satisfaction with online transactions. Customer satisfaction and usage intention will be enhanced when MB platforms are adjudged credible. It is also in line with Foughiet al., (2019) viewpoint that the perception of customers toward the ability of MB platforms to deliver reliably and securely determines the rate of adoption, satisfaction, and usage intention. Due to the increasing cases of internet fraud, consumers are keen on adopting MB if they perceive it as credible and trustworthy in preventing transaction failure and disclosing sensitive customers' personal information (Priya et al., 2018).

The study also found that social influence has a positive but insignificant impact on customer satisfaction and continued usage intention. This outcome is similar to the finding of Bankole et al. (2011) on the non-significant role of social influence on mobile banking adoption in Nigeria. However, this finding is contrary to the outcome of the studies of Patel (2016) and Farah et al., (2019) that found social influence to play a significant role in users' satisfaction with MB.

Finally, the study revealed that customer satisfaction positively and significantly impacts the continued usage intention of the MB app. The study also showed that customer satisfaction mediates the relationships between perceived usefulness and credibility and continued usage intention of MB apps among customers. The outcomes are supported by the findings of Priya et al. (2018) that customer satisfaction determines and mediates usage or adoption intention in diverse contexts.

## 5.0 CONCLUSION AND POLICY IMPLICATIONS

### 5.1 Conclusion

MB apps are increasingly gaining popularity. It enhances banks' profitability by minimising costs, widening service coverage, and promoting operational efficiency. The adoption of MB apps transforms the customer experience by making transactions more convenient, available, time-saving, and secure for customers. It also enhances customers' access to financial services. To improve MB adoption rates, banks have often targeted younger and more educated customers, like university students, since they are better informed and open to innovation. Based on this, this study investigated how customer satisfaction and continued usage intention are influenced by MB app adoption among university students. MB app adoption constructs used in the study include perceived usefulness, perceived ease of use, perceived credibility, and social influence.

Data were generated via an electronically filled questionnaire submitted by 516 university students. However, 475 responses were found to be valid and were used for data analyses. Based on the outcomes of the estimated model using structural equation modeling, the study found that perceived usefulness and perceived credibility positively and significantly impact customer satisfaction and their continued usage intention.

However, the study revealed that perceived ease of use and social influence did not considerably

impact customer satisfaction and continued usage intention. The study also showed that customer satisfaction mediates the relationships between MB app adoption (perceived usefulness and credibility) and continued usage intention among banking customers. Therefore, the study concludes that perceived usefulness and credibility are the most critical factors driving customer satisfaction and their continued usage intention.

### 5.2 Policy Implications

This study presents some implications for banks. It has been empirically proven that satisfied customers are likely to be more loyal, engage in repeat purchases, and exhibit a higher likelihood of patronage or continued usage (Isibor & Odia, 2020). Based on the finding of this study that perceived usefulness and credibility positively and significantly impact customer satisfaction and continued usage intention: banking service providers must strategise to enhance the perceived effectiveness and level of credibility associated with their MB apps. Banks that desire to capture the undergraduate students' market must improve the functionality of their app by increasing the financial services offered via their MB app. Promotional activities of the banks on MB apps should focus mainly on enlightening both present and potential customers on the usefulness of the technology.

The promotional messages can be built on the apps' ability to provide a scintillating customer experience, including accessing banking services 24 hours a day. Monitoring deposits and withdrawals, making instant payments and settling bills, tracking transactions, and gaining easy access to customer services virtually, among others. Banks could also partner with universities so that their MB app becomes a one-stop platform for students to settle university-related financial matters. It is also recommended that banks continuously review and update their mobile apps to meet the dynamic needs of their customers of the MB apps.



The positive and significant role of perceived credibility on customer satisfaction and continued usage intention has implications for banking service providers. First, due to the rising cases of internet fraud in Nigeria and globally, it is recommended that banks should put in place measures to continuously protect their database and other sensitive customers' personal information from being hacked by fraudsters. Notably, bank customers should also be regularly sensitised on the procedures and tips for protecting their mobile banking apps against fraud. The strategies recommended for banks to beef up MB app security include adding a multi-factor authentication feature to the app, encouraging the use of Near Field Communication (NFC) embedded cards, and conducting security audits and penetration tests via end-to-end encryption. Promoting the use of the fingerprinting device, offering real-time text and email alerts, safeguarding digitalised documentation, and using secure and positive technologies like https. Furthermore, banks can enhance the level of credibility students perceive to be associated with their MB app by managing issues relating to the reliability and security of the app.

The study offers some policy implications as follows. First, the study contributes to the discourse on adopting MB apps and how it impacts customer satisfaction and continued usage intention. The study empirically tested the impact of MB app adoption constructs such as PUB, PEB, PCB, and SIB on customer satisfaction and continued usage intention among young and educated university students. The study is considered strategic by focusing on university students because they represent unique financial market segments that are often first-time account holders and could evolve into profitable clients in the future if properly nurtured and managed (Evbayiro-Osagie, Isibor & Ithemefor 2017).

Second, aside from testing the direct effects of PUB, PEB, PCB, and SIB on customer satisfaction and continued usage intention, the study expanded the frontier of knowledge by empirically establishing the mediating role of customer satisfaction on the relationship between MB app adoptions constructs and continued usage intention. Third, to the best of the researchers' knowledge, this study is among the foremost studies on MB app adoption that predominantly focus on university students, especially in Nigeria. The research outcomes further validate the potency of the technology acceptance model in explaining customer satisfaction and continued usage intention via MB app adoptions. Fourth, the insignificant effect of perceived ease of use on satisfaction and continued usage intention has tremendous implications for the design and development of MB apps for this segment of bank customers. Developers in this market must not substitute desirable functionality for simplicity. It is because, in the case of university students, understanding and using MB apps may not be too challenging given their level of education and familiarity with innovative digital technologies.

## 6.0 LIMITATIONS AND SUGGESTIONS FOR FUTURE STUDIES

There are various dimensions of MB app adoption. However, this study focused only on four of them. Future studies should incorporate other variables such as corporate image, perceived quality, perceived value, complaint handling, perceived risk, confirmation, and structural assurance in the research model to provide a more robust understanding of the subject matter. Secondly, the study focused only on university students. Since banking customers in the Universities are students and non-students. It is suggested that future studies should include non-student customers in their sample and possibly compare the two groups to establish any significant difference in their perception of MB app adoption.

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## Linkages Between Banking System Stability and Sustainable Economic Development: Evidence from Nigeria



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### Abstract

*This study explored the Banking System Stability Index and its components, and ascertained how accurately they reflect achievement of goals on per capita income, labor force participation and unemployment rate using data obtained from Central Bank of Nigeria collected on quarterly bases and other secondary sources covering 2000 to 2020. Unit root tests were conducted to ascertain the level of stationarity of the data. The Zivot and Andrews and ADF methods of unit root were applied. The autoregressive distributed Lag model and the ordinary least squares were adopted for analysis. Results showed that banking system stability is neither related to per capita income nor labor force participation, but actually related to unemployment rate. Consistently having a stable banking system is critical but not a sufficient condition for achieving these development goals. It is recommended that economic climate index and banking vulnerability index should be given more weights in determining*

*banking system stability, and other considerations such as society, environment and culture are integral parts in sustainable development.*

**Keywords:** *banking, system, stability, index, development, goals*

### 1.0 Introduction

#### 1.1 Background of the Study

A stable banking system is a necessity for economic development. A stable banking system enables financial institutions to optimally play intermediation roles and demonstrate resilience in responding to shocks and other financial crises in the system, and ultimately lead to the achievement of national development goals. Issues relating to financial crises are often attributable to instability in the banking or financial sector. Sere-Ejembi, Udom, Salihu, Atoi & Yaaba (2014) for instance noted that the Asian financial crisis of 1997-1998, and the 2008 global financial crisis that originated from the USA have renewed efforts to search for more frameworks for monitoring financial sector stability, suggesting that fragility of the system led to financial crises.

Several studies have been done on the imperatives of banking system stability (BSS) and its determinants. There is however a tendency to view BSS as an end in itself, rather than a channel through which development goals are achieved. There is a dearth of literature on empirical evidence linking BSS with development goals. Examining this link will have implications for applying the right contexts in defining BSS and identifying its appropriate determinants, considering environmental differences and complementariness required of government policies. This serves as a primer for this study.

There have been several studies advancing what should be considered as determinants of BSS. Most studies indicated the generic macro indices (Sere-Ejembi et al, 2014), while some adopted a methodology with a blend of micro and macro indices (Jahn & Kick, 2012). Interestingly, Sere-

Ejembi et al (2014) observed that there is no consensus on how to measure systemic fragility and which explanatory variables to include in the model, and went further to suggest and apply the following indices in determining a BSS index: capital adequacy, asset quality, liquidity, profitability, banking vulnerability index and economic climate index. It is instructive and often ignored that relevant indices measurements ought to factor in contextual issues and peculiarities of environment in order to derive the best use of these indices. BSS indices are important for planning and development purposes. It is only through an understanding of each indicator, applied in the right context that an appropriate and useful model can be developed to determine the BSS index.

It has been established that financial sector development can contribute to reaching development goals through policy interventions and financial support. Claessens and Feijen (2006) found evidence of a positive association between financial development and the following development goals: health, education and gender equality. A key enabler identified is access to finance. This is often mentioned as a key determinant of BSS. The flip side however is that access to finance may not necessarily promote the utilization of productivity enhancing assets. The issue of access to finance, as with other determinants of BSS needs to be understood in the right context and with the benefits of complementariness of government policies. BSS determinants could produce conflicting results at variance with priori expectations. Sen (2010) appeared to underscore this by saying there is little doubt that financial development leads to higher economic growth which may then lead to poverty reduction.

Ideally a stable financial system should contribute to broader economic growth and rising living standards (CBN, 2013). BSS may however not equally predict or determine development goals due to some unintended consequences of

otherwise appropriate development objectives. An example is capital adequacy ratio as a determinant of BSS. Enforcement of capital adequacy may result in either increase of equity or reduction of loan. The latter occurs when banks reduce lending to meet up capital adequacy ratio, and this in turn could result in an increase in borrowing cost. D'Erasmus (2018) said "for every 1 percent increase in capital minimum, lending rates will rise by 5 to 15 basis points and economic output will fall 0.15 percent to 0.6 percent". As such, increases in borrowing cost would necessarily curtail lending and affect the economy adversely. Capital adequacy would therefore have to be understood in the right context, and considering environmental conditions.

Bank profitability is also widely considered a significant determinant of BSS. In Nigeria, banks are known to mostly declare huge profits. Adekola (2016) showed positive effects of banks profitability on economic growth. It is however doubtful if this has translated into development for the economy. Government policies and arbitrage opportunities may give rise to high profitability of banks and the after effect may not be economic development. A critical look at banks liquidity as a determinant of BSS would also reveal that little is known about the cyclical properties of banks liquidity and buffers. The link between liquidity holding and current cash flows for internal finance is loose or non-existent. While banks build up liquidity buffers in period of weak economic growth, they draw down on the buffers in periods of strong economic growth. Applying liquidity as a BSS determinant ought to factor in these complexities.

Other BSS determinants such as human development index and life expectancy also come with their complexities. Besides these are more or less the development goals that BSS ought to determine. The human development index is a development predictor which has a number of limitations including the fact that it is not a comprehensive measure of human development.

Also, according to Acemoglu and Johnson (2007), studies have not sufficiently established a causal effect of health and disease on economic growth. Again, referring to Sere-Ejembi et al (2014), there is no consensus on how to measure systemic fragility and which explanatory variables to include in the model. Defining each generic variable in the context of the environment would enable the development of a model which would be more appropriate to explain, predict and relate BSS to development goals of increasing per capita income, reducing poverty, enhancing social and health indicators and improving occupational pattern.

## 1.2 Statement of Problem

The issue of poor economic development in Sub Saharan Africa is topical. There is a growing concern that the problem of poor economic development is endemic in the region. To underscore the severity of this problem, Rodriguez-Pose and Tijmstra (2007) wrote that "it has often been argued that Africa in general, and Sub-Saharan Africa in particular is "different" and that it therefore requires 'exceptional' solutions to its development problems". Since Nigeria launched its first National Development Plan (1962-1968) and subsequently more development plans, it is yet to achieve significant milestones in economic development. Adams (2019) articulated the effects of the challenges confronting Nigeria's economy to include ineffective leadership and corruption, over-reliance on oil, inflation, unemployment, inadequate infrastructure and power supply, inadequate health services, insecurity. Poor economic development translates into poor living standard, and is indicative of poor quality of life of citizens.

A critical look at development indices in Nigeria point to a dire situation which requires 'exceptional' solutions. Per capita income in Nigeria has recorded little or no growth in the last decade. It actually reduced by 3.2% in 2016 and further reduced by 0.03% in 2017. The marginal growth recorded in 2018 and 2019 of 1.45% and

1.18% respectively are the least percentage growth recorded since 2000 (Nigeria GDP-per capita Index Mundi, 2019). The actual figures also suggest that Nigeria is not a developed country by any measure. Nigeria's human development index of 0.532 as at 2017 (UNDP, 2017) puts the country in the low human development category. Reports on poverty level in Nigeria indicated widespread poverty especially in rural areas. Poverty rate in Nigeria between 1980 and 2010 rose by 153.6%, and is currently estimated at a staggering 50% of the population. (Kazeem, 2018). Current average life expectancy of 54.5years (Men 53.7years and Women 55.4years) in Nigeria according to WHO (2019) is also indicative of health issues in the country.

Though several studies have been done aimed at developing methodologies for determining banking system stability, there is a dearth of this literature in developing economies, particularly in Nigeria. The contemporary study by Sere-Ejembi et al (2014) is comprehensive and resulted in the development of a Banking System Stability Index (BSSI) for Nigeria. This perhaps is the most recent study done in this regard with its methodology adapted from Nicholas and Isabel (2010).

Banking System Stability rate should not only be viewed in the premise of stable individual financial institutions and stable macro economy, but more holistically with regard to the trajectory of development goals. This introduces the concept of development trajectories. If the banking system stability indices are not indicative of economic development, the bases for determining the indices may have to be reconsidered. Otherwise, the relevance of the indices would be limited to micro-economics factors. There is indeed a nexus between macro-outcomes and banking system fragility. Bell and Pain (2000) alluded to this by asserting that outcomes from regression approaches (to determining BSS) tend to be connected with an increased probability of a banking crises. A subject that should also be of interest is the fragility of development trajectories.

As the BSSI is capable of acting as an early warning mechanism of banking system fragility, it should also be indicative of fragility in development trajectories.

Interestingly Central Bank of Nigeria (CBN) has severally over time assessed the Nigeria banking system as stable, yet the country remains undeveloped. CBN (2016) reported that "the Nigerian financial system remains stable and resilient in spite of prevailing macroeconomic challenges". This may suggest that stability of the system is not a sufficient condition to engender growth or the failure of BSS indicators to correctly assess the economy and propel the country towards development.

### 1.3 Research Questions

- a. Does bank system stability support growth in per capita income?
- b. Does bank system stability support reduction in unemployment rate?
- c. Does bank system stability support growth in labor force participation rate?
- d. Which banking system indicator (Banking Soundness Index, Banking Vulnerability Index and Economic Climate Index) better relates with each development goal?

### 1.4 Objectives of the Study

Banking System Stability is essential to prevent costly failure of individual financial institutions, and instability in the macro economy. A stable banking system should engender stable constituent financial institutions, and in a broader manner, promote stability, growth and development of the economy. A banking system stability index which measures banking system stability, would be both diagnostic and predictive, serving as warning mechanism of potential vulnerabilities.

This study explores the BSSI as determined by Sere-Ejembi et al (2014), and ascertained validity of the indices (as well as the bases for determining the indices) as indicators of the following development goals:

- a. Per capita income

- b. Unemployment rate
- c. Labor force participation

### 1.5 Statement of Hypotheses

- a. BSS is not related to per capita income
- b. BSS is not related to unemployment rate
- c. BSS is not related to labor force participation rate

### 1.6 Significance of the Study

This study will appraise current method of determining BSS indices. BSS will be related to development goals and not treated as an end in itself. The effects of each BSS variable on the achievement of development goals will be determined. It will therefore be possible to determine which BSS indicator better relates to development goals and this will shape the focus of policy initiatives.

The findings will contribute to the discourse in academics on the imperatives of banking system stability for economic growth and development. The study subjects the widely held view that a stable banking system leads to positive macro indices to empirical tests, and suggests reasons for the findings. The findings and reasons attributed will spur more academic exercise towards identifying the real triggers of economic development.

## 2.0 Literature Review

### 2.1 Conceptual and Empirical Review

Banking system stability is determined by four indices: Capital Adequacy (Mohamed, 2018; Nguyen, 2021); Asset Quality (Ariff, 2019); Banking Vulnerability (Amadi et al, 2021); and Economic Climate (Ntarmah et al, 2019). Several studies have also suggested that a stable banking system results in sustainable economic development (Ntarmah et al, 2019; Kong et al, 2020; Amadi et al, 2021). Banking system stability plays a role in economic sustainable development. Stability enhances the capacity of banks to effectively play their intermediation role in the economy. A derivative of banking system stability



is sustainable economic development, and the following are indices of sustainable development: Higher per capita income (Ntarmah et al, 2019); and labor force participation and unemployment rate (Foot, 2003; World Bank, 2020).

A number of indicators have been identified as pointers to banking system stability (BSS). Studies either specified the generic indicators of BSS, or viewed indicators in terms of risk profile (contagion and systemic). An approach to understanding BSS indicators is to identify micro and macro factors, and as in some studies to combine both micro and macro considerations indicative of BSS. Sere-Ejembi, Udom, Salihu, Atoi & Yaaba (2014) identified the following generic indicators of BSS: capital adequacy, asset quality, liquidity, profitability, banking vulnerability and economic climate. These generally represent the generic indicators of BSS established in several studies.

Jahn and Kick (2012) introduced the model that contained both micro and macro factors by analyzing both individual banks indices and these generic indicators represented by CAMELS taxonomy (capital adequacy, asset quality, management, earnings, liquidity and sensitivity to market risk). Hartmann, Straemans and Vries (2005) in a Cross-Atlantic study focused on risk structure and analyzed as indicators of BSS, contagion risk (individual banks exposure to each other) and systematic risk (issues with capital markets) thus also applying both micro and macro prudential measures.

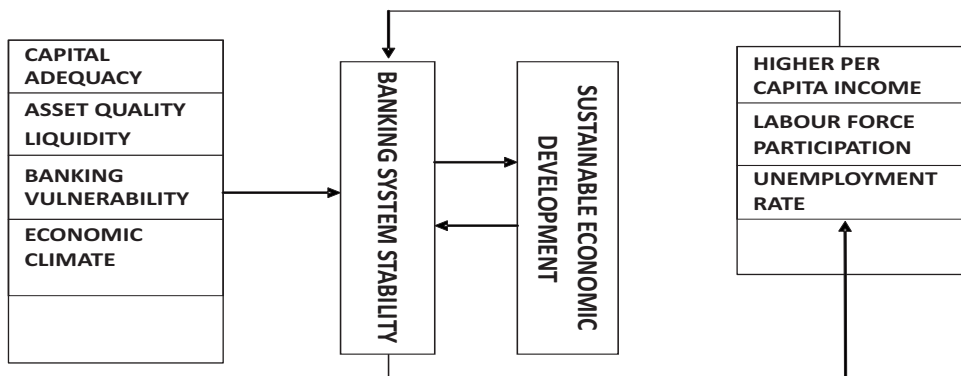
There seem to be a consensus in literature that BSS leads to economic growth and development, though studies have also demonstrated conflicting results when indicators are separately analyzed. Monnin and Jokipii (2010) underscored the importance of BSS for real output growth, but showed that there is no clear link between BSS and

inflation. Manu, Adjasi, Abor & Harvey (2011) in a similar follow up study in Africa concluded that financial stability impacts positively on economic growth. Specifically, the study indicated that capital adequacy, liquidity and asset quality had significant effects on GDP growth rate in both long and short run.

Interestingly, Sotiropoulos, Giakoumatos & Petropoulos (2019) in a study of 28 countries in Europe found that results for the impact are mixed; while investment and trade openness played a significant role and promote economic growth, inflation and government expenditure had a negative effect. In that study, results indicated that the development of BSS had a negative impact on economic growth. Again, a study of 41 African countries suggested that financial development and financial liberalization have positive effect on financial instability (Batuo, Mlambo & Asongu, 2017).

The thrust of this paper is to advance a thesis that the right indicators would depend on the environment and the contexts in which it is applied, and it would also appear that associating BSS to economic development is overrated, particularly if such growth does not translate into development. Perhaps Valickova, Havranek, & Horvath (2014) alluded to this when they concluded that the effect of the banking sector on economic growth in less developed countries is weaker and it is decreasing worldwide after the 1980s. As such the strength of each BSS indicator should be factored into the methodology for determining BSS for effective planning purposes.

This paper however builds on the understanding that BSS is largely indicative of economic growth and the assumption that this leads to development as depicted in the following conceptual framework, which will be tested in this paper.



**Figure 1:** Conceptual Framework: Authors' Analysis (2022)

BSS is an important driver of economic growth. Monnin and Jokipii (2010) through a study of 18 countries between 1980 and 2008 argued that monetary policy should pay more attention to banking sector soundness since they found BSS to be an important driver of economic growth. Prochniak and Wasiak (2017) also underscored the relationship, but concluded that the relationship between financial sector stability and economic growth is nonlinear. The analysis covered 62 economies between 1993 and 2013 and applied the following as measures of the financial sector: domestic credit, non-performing loans, bank capital to asset ratio, market capitalization of listed companies, turnover ratio of stocks traded, and monetization ratio. Also, a study based on 28 countries of the European Union between 2004 and 2014 concluded differently that the development of banking system has a negative impact on economic growth (Sotiropoulou et al 2019). There is a growing interest in determining the significance and nature of the relationship between financial system stability and economic growth.

It can be deduced from these studies that there are mixed results, and the effect of banking system stability on economic growth and by extension development, depends on several other factors including measurements, environment and perhaps timing. Also, there are mixed results in the effects of constituent indicators of BSS on economic growth. In the African study by Manu et al (2011), it was found that capital adequacy,

liquidity and asset quality had significant effects on economic growth. Appiah, Amoasi & Frowne (2019) in a study between 1990 and 2015 also found that human development had a positive effect on economic growth and development in African countries.

**2.1.1 Banking System Stability and Per Capita Income**

Per Capita Income is a growth factor, and as with other growth factors, researches have been done to understand its interaction with banking system stability. Ntarmah, Kong & Gyan (2019) concentrated on a study of the BSS and economic sustainability, with Adjusted Net Savings and Gross Domestic Products as indicators of economic sustainability, and found mixed results with respect to components of the BSS, and also differences in economic environments (BRICs and non-BRICs economies). The study found that non-performing loans significantly and negatively influence GDP per capita in both economies, while banking system regulatory capital significantly and positively influence GDP per capita of only BRICs economies.

Bank profitability contributes to banking system stability as demonstrated in Eweke (2019). Thus, it is expected that with enhanced bank profitability per capita income should increase, consistent with studies which found positive relationship between bank profitability and economic growth (Adekola, 2016; Moussa, Aymen & Hdidar, 2019). It is expected that with enhanced bank profitability,

per capita income increases. This however is not always the case. Klein and Weill (2022) explained clearly that the influence of bank profitability on economic growth remains an open question. According to them, while it can favor economic growth by strengthening financial stability, it can also result from lower competition and as such depress economic growth.

Apparently, there are mixed results in the relationships between bank profitability and economic growth, and by extension BSS and GDP per capita. Each economy is unique with its fundamentals, and this understanding should guide not only what constitutes financial system indicators, but how they are used to serve as indicators in development trajectories.

### 2.1.2 Banking System Stability, Employment Rate and Occupational Pattern

The World Bank (2020) described a stable financial system as that which is capable of efficiently allocating resources, assessing and managing financial risks, maintaining employment levels close to the economy's natural risk, and eliminating relative price movements of real or financial assets that will affect monetary stability or employment levels. Also, Foot (2003) described financial stability as a situation where employment levels are close to the economy's natural rate.

There is a dearth of literature on the direct link between BSS and employment pattern. It is expected that BSS should create opportunities for growth (Amadi et al, 2021; Barra & Zotti, 2021) which invariably leads to improved employment. On the flip side, more opportunities also create more risks which is the down side.

Potentially results of the relationship between BSS and employment will be mixed and should be studied and understood within the contexts of each economy. Also, what works in a particular period may not work in future periods, thus a dynamic process is required to determine components and measures of BSS. According to European Commission (1998), future employment

rate will depend on economic and social conditions which may strongly differ from previous periods.

### 2.2 Theoretical Review

The relationship between BSS and per capita income goes to the root of the financial intermediation theory. Higher income suggests more savings and fuels the supply of finance from surplus saving units. This results in a profitable banking sector. The financial intermediation theory stipulates that bank collects deposits from surplus saving units and lends to deficit finance units.

Also, the credit creation theory of banking considers banks as financial intermediaries as capable of creating credit when granting loans at a profit. Quite a number of theories suggest and support the link between BSS, poverty and employment level. Claessen and Feijen (2006) provided theoretical backing through the Direct/Indirect Channel approach by identifying indirect approach linking developed (stable) financial sector to poverty reduction through economic growth; and direct approach through improved access to financial services by the poor and underprivileged. Interestingly Kuznets's Inverted U-Hypothesis provided theoretical support to a possible non-linear relationship by suggesting that economic growth may increase inequality at the early stage of development but reduce it at the mature stage of industrialization (Kuznets, 1955). The "trickle-down" theory also postulated that economic growth would either trickle down to the poor through job creation and other economic opportunities or create the necessary conditions for the wider distribution of the economic and social benefits of growth (Todaro, 1997).

Social and health indicators generally relate to standard of living and indicators of capacity to generate income from employment. The theories applicable to poverty reduction equally explains the nexus between BSS and social/health

indicators. It is also established that financial system development, under some conditions, may be positively related to economic growth and by extension, improvements in social and health indices. The finance-growth hypothesis is popularized by the neoclassical growth theory which says that an increase in the efficient investment of savings in new and innovative projects is one of the main engines of economic growth. The neo-classical theory was pioneered by Barro (1991).

Occupational pattern refers to the spread of workforce among different activities. Fisher (1933) theory of occupations analyzed workforce categories into primary, secondary and tertiary, and suggested that as national income rises and basic necessities of life are met, there will be an occupational shift of labor into the service or tertiary sector. Clark (1940) supported this and further noted that in the first phase of economic development, there is considerable decline in the proportion of persons in agriculture and allied occupations. Kuznets (1955) also supported the theory of occupations and confirmed that there is an occupational shift to the tertiary sector as a nation experiences more growth.

Furthermore, endogenous growth theories (Aghion & Howitt, 1992; Grossman & Helpman, 1991; Romer, 1990) posit that differences in research and development and human capital lead to differential growth in technical changes and accumulation.

**3.0 Methodology**

This study employed the descriptive and causal research designs. Descriptive research design examines the characteristics of the data with graphs while causal design is applied to determine the causal effect of BSS and its components on development goal (per capita income, unemployment and labor force participation rate). Data was collected from 2000 to 2020 on quarterly bases from the Central Bank of Nigeria (CBN) for the variables BSS, BSI, BVI, ECI, CPI, LBF and

unemployment rates.

The BSSI is obtained by computing the weighted averages of the three sub-indices

$$BSSI_t = w1 BSI_t + w2 BVI_t + w3 ECI_t$$

$$\sum_{p=1}^3 w_p = 1$$

where  $w_p$  is the weight attached to each sub-index connoting its relative importance.

**3.1 Methods of Data Analyses**

The auto-regressive distributed Lag model (ARDL) and the ordinary least squares (OLS) were adopted for this study. The following are the assumptions of ARDL

- a. It is expected that all of the series are I (0), and hence stationary. In this case, we can simply model the data in their levels, using OLS estimation, for example.
- b. It is expected that all of the series are integrated of the same order (e.g., I (1)), but they are not cointegrated. In this case, it can just (appropriately) difference each series, and estimate a standard regression model using OLS.
- c. It is expected that all of the series are integrated of the same order, and they are cointegrated. In this case, it can estimate two types of models: (i) An OLS regression model using the levels of the data. This will provide the long-run equilibrating relationship between the variables. (ii) An error-correction model (ECM), estimated by OLS. This model will represent the short-run dynamics of the relationship between the variables (Pesaran & Shin, 1999; Pesaran, Shin, & Smith, 2001).

The basic form of an ARDL regression model is:  
 $Y_t = \beta_0 + \beta_1 Y_{t-1} + \dots + \beta_k Y_{t-p} + \alpha_0 X_t + \alpha_1 X_{t-1} +$

$$\alpha_2 X_{t-2} + \dots + \alpha_q X_{t-q} + \epsilon_t \dots (I)$$

where  $\epsilon_t$  is a random "disturbance" term.

Which becomes;

$$\Delta y_t = \beta_0 + \sum \beta_i \Delta y_{t-i} + \sum \gamma_j \Delta x_{1t-j} + \sum \Delta k \Delta x_{2t-k} + \phi z_{t-1} + \epsilon_t \dots (ii)$$

For this study, since it is concerned with long-run and short-run relationships, the following unrestricted error correction model is formulated

$$\Delta PCIt = \beta_0 + \sum \beta_i \Delta PCIt-i + \sum \gamma_j \Delta BSS_{t-j} + \theta_0 PCIt-1 + \theta_1 BSS_{t-1} + \phi z_{t-1} + \epsilon_t \dots (iii)$$

$$UNEM_t = \beta_0 + \beta_i BSS_t + \epsilon_t$$

... (iv)

$$\Delta LBF_t = \beta_0 + \sum \beta_i \Delta LBF_{t-i} + \sum \gamma_j \Delta BSS_{t-j} + \theta_0 LBF_{t-1} + \theta_1 BSS_{t-1} + \phi z_{t-1} + \epsilon_t \dots (v)$$

$$\Delta PCIt = \beta_0 + \sum \beta_i \Delta PCIt-i + \sum \gamma_j \Delta BSI_{t-j} + \sum \gamma_j \Delta BVI_{t-j} + \sum \gamma_j \Delta ECI_{t-j} + \theta_0 PCIt-1 + \theta_1 BSI_{t-1} + \theta_2 BVI_{t-1} + \theta_3 ECI_{t-1} + \phi z_{t-1} + \epsilon_t$$

... (vi)

$$\Delta UNEM_t = \beta_0 + \sum \beta_i \Delta UNEM_{t-i} + \sum \gamma_j \Delta BSI_{t-j} + \sum \gamma_j \Delta BVI_{t-j} + \sum \gamma_j \Delta ECI_{t-j} + \theta_0 UNEM_{t-1} + \theta_1 BSI_{t-1} + \theta_2 BVI_{t-1} + \theta_3 ECI_{t-1} + \phi z_{t-1} + \epsilon_t$$

... (vii)

$$\Delta LBF_t = \beta_0 + \sum \beta_i \Delta LBF_{t-i} + \sum \gamma_j \Delta BSI_{t-j} + \sum \gamma_j \Delta BVI_{t-j} + \sum \gamma_j \Delta ECI_{t-j} + \theta_0 LBF_{t-1} + \theta_1 BSI_{t-1} + \theta_2 BVI_{t-1} + \theta_3 ECI_{t-1} + \phi z_{t-1} + \epsilon_t$$

... (viii)

Where:

PCI = per capita income

UNEM = unemployment rate

LBF = labor force participation rate

BSS = bank system stability

BSI = Banking Soundness Index

BVI = Banking Vulnerability Index

ECI = Economic Climate Index

$\epsilon_t$  = error terms

$\phi z_{t-1}$  = error correction coefficient

$t-1$  = timelag

$t$  = Time  $t$

### 3.2 Bound Test

Applying Bounds test to this study requires that ARDL model must be used for the estimation of level relationships because the model suggests that once the order of the ARDL has been recognized, the relationship can be estimated by OLS. Second, the bounds test allows a mixture of I (1) and I (0) variables as regressors, that is, the order of integration of appropriate variables may not necessarily be the same. Third, this technique is suitable for small or finite sample size (Pesaran et al., 2001).

The following hypothesis is formulated to determine the long-run relationship between the variable

$$H_0 = \beta_1 = \beta_2 = \beta_3 = 0$$

(No long-run relationship)

Against the alternative hypothesis

$$H_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq 0$$

(a long-run relationship exists)

According to these authors, the lower bound critical values assumed that the explanatory variables  $tx$  are integrated of order zero, or I (0), while the upper bound critical values assumed that  $tx$  are integrated of order one, or I (1). Therefore, if the computed F-statistic is smaller than the lower bound value, then the null hypothesis is not rejected and it concludes that there is no long-run relationship.

Conversely, if the computed F-statistic is greater than the upper bound value, then there exists a long-run level relationship. On the other hand, if the computed F-statistic falls between the lower and upper bound values, then the results are inconclusive.

## 4.0 Estimation and Results

### 4.1: Results

Table 1 represents the descriptive statistics of the variables. Labor force participation had an average rate of 55.02 while the average rate of growth of PCI 1.8%. The mean of unemployment rate is 4.83%. The Averages of BSI, BVI, ECI and BSSI are 1.00, 1.02, 0.99 and 1.01 These values are

approximately 1, indicating that the BSSI and its components are stable and the stability are good for achieving desired developmental growth. Table 2 shows the correlational relationships among the variables. BSSI correlated

positively to LABOF, PCI and UNEM by 40.2%, 39.3% and 55.8%. Also, BSI, BVI and ECI correlated to LABOF negatively and positively. To PCI and UNEM by the same order.

Graphical

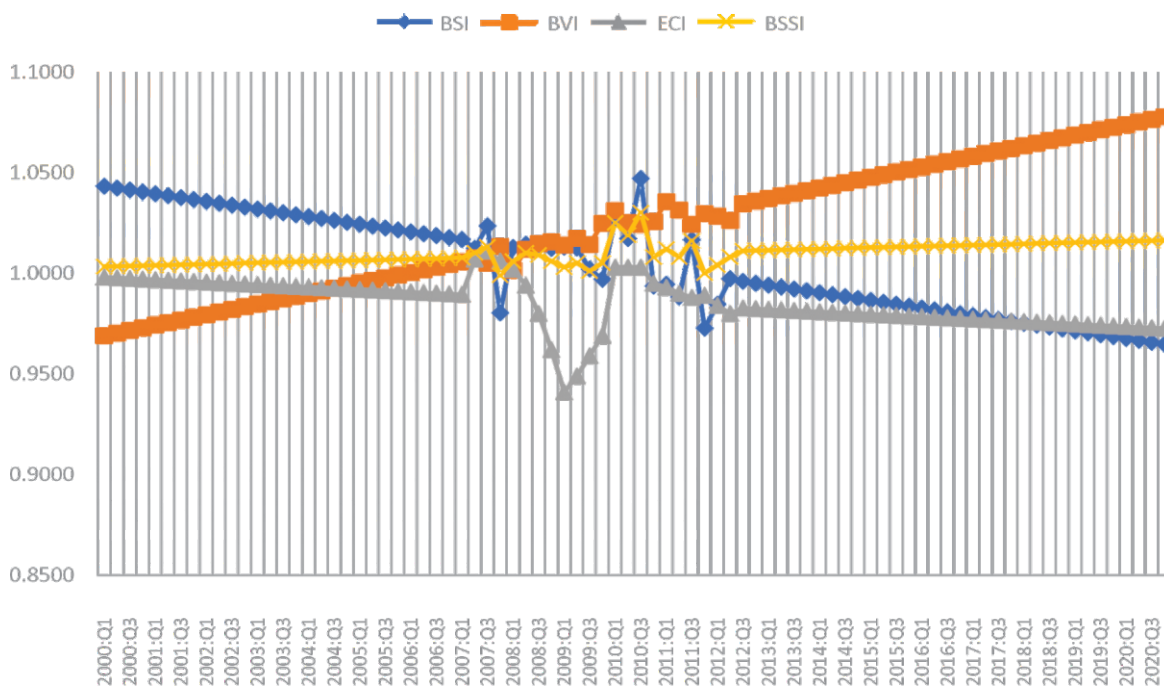


Figure 1: Banking Vulnerability Index, Banking Soundness Index, Economic Climate Index and Aggregate Banking System Stability (BSSI)

Figure 1 shows the graphical presentation of Banking Vulnerability Index (BVI), Banking Soundness Index (BSI) and Economic Climate Index (ECI) with the aggregate banking system stability index (BSSI). The result revealed that BVI has a steady increasing trend from 2000 to 2020. However, there was a fluctuation from the second quarter of 2007 which lingered till the second quarter of 2012 but became stable till 2020 fourth quarter.

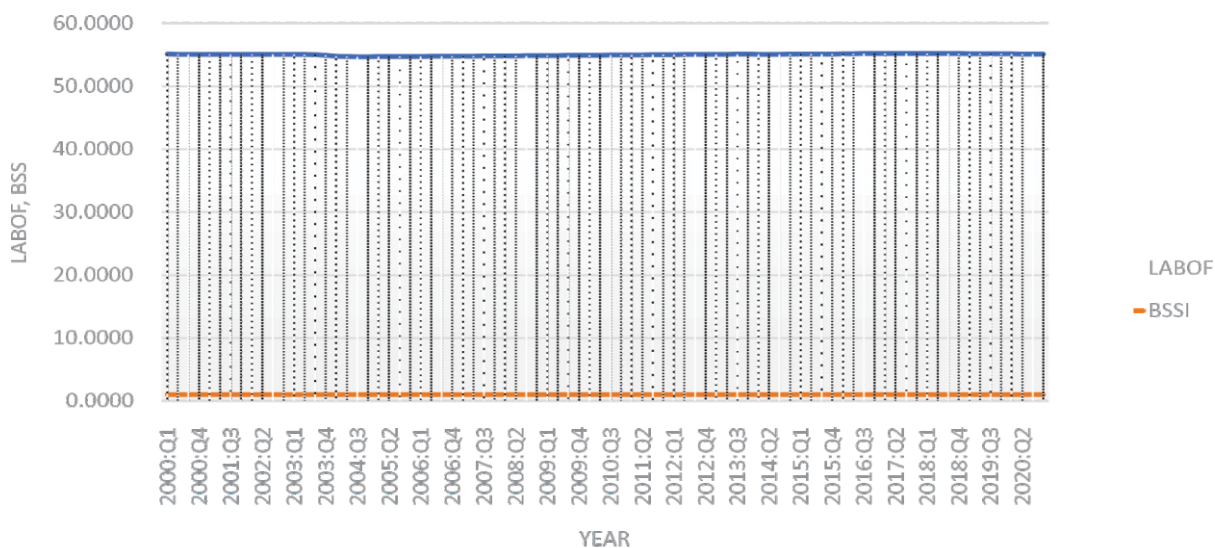
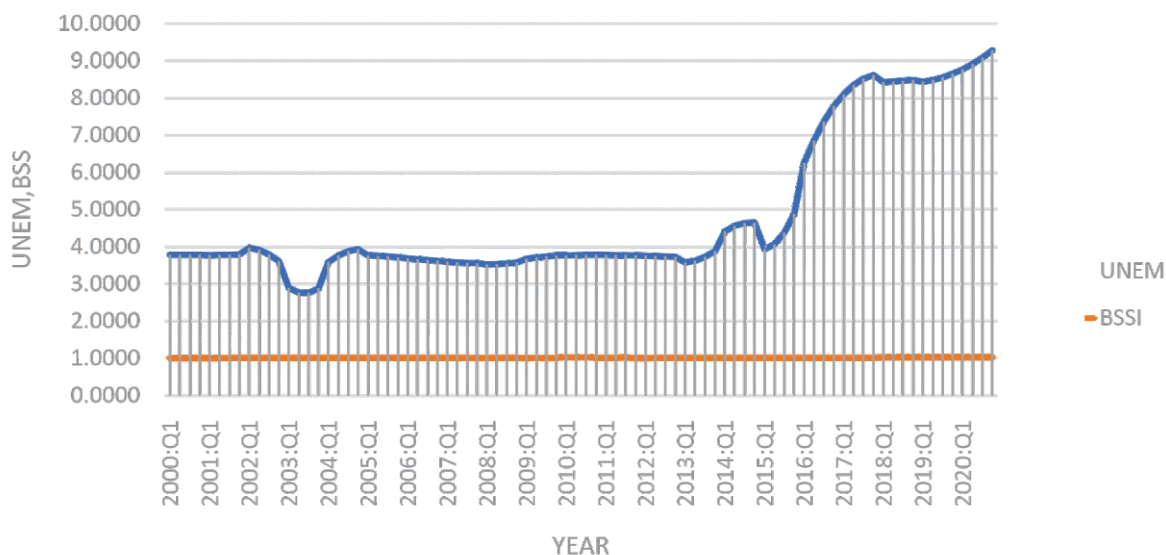


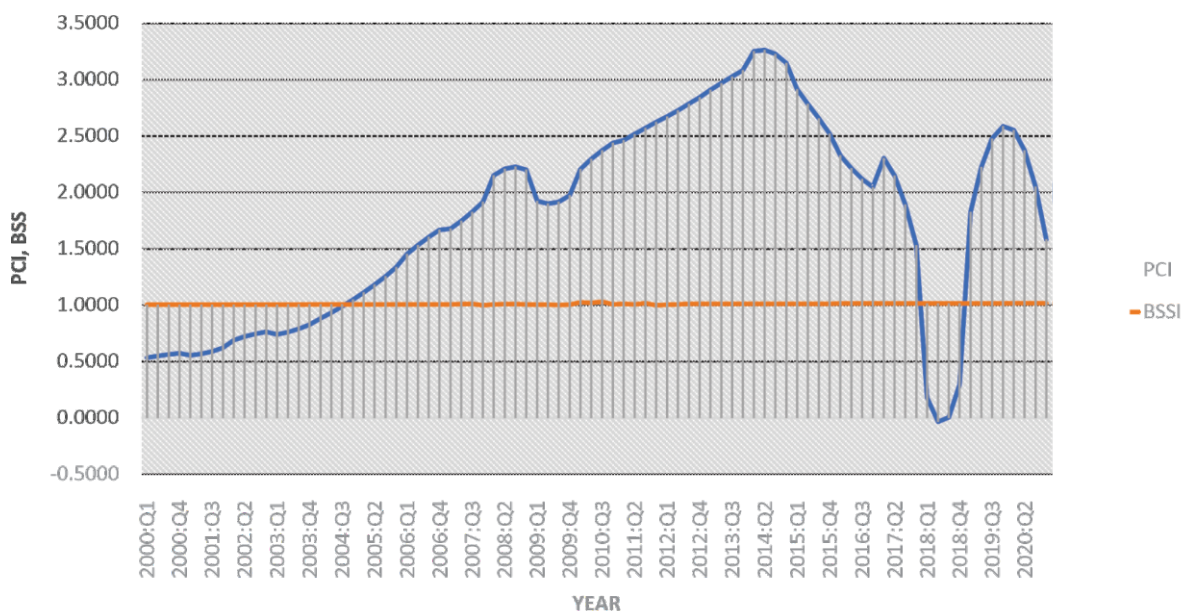
Figure 2: Relationship between Labor Force Participation (LABOF) and Banking System Stability (BSSI)

Figure 2 reveals the graphical presentation of the relationship between labor force participation and banking system stability index (BSSI). The threshold for BSSI indicated that any level above zero implies stability of banking sector/system is above average. The farther away or above zero, the more stable it is. But any value below zero is unstable.



**Figure 3:** Relationship between Unemployment (UNEM) and Banking System Stability (BSSI)

Figure 3 revealed the graphical presentation of the relationship between unemployment (UNEM) and banking system stability index (BSSI) in Nigeria within the period of study.



**Figure 4:** Relationship between Per Capita Income (PCI) and Banking System Stability (BSSI)

Figure 4 shows the relationship between per capita income (PCI) and banking system stability index (BSSI). The graph revealed that the PCI in Nigeria has not been stable over time.

## 4.2 Pre-diagnostic test

### Unit root Test

Unit root tests were conducted to ascertain the level of stationarity of the data. (Appendix II). The Zivot and Andrews and ADF methods of unit root were applied. Zivot and Andrews unit test considers structural break. It is a sequential test which utilizes the full sample and uses a different dummy variable for each possible break date. The result is presented in Table 3.

Table 3, shows the unit root result of the variables used for this study. The result revealed that BSSI, UNEM, and ECI are stationary at level. While PCI, LABOF, BSI and BVI are stationary at first difference. Based on the research objectives, the models 4, 6, 7, 8 and 9 were estimated using the approach of ARDL. Only model 5 was estimated by OLS given that the variables in models 4, 6, 7, 8 and 9 had a mixture of integration order of I (0) and I (1), while model 5 variables had integration order of I (0). The unit root structural break was applied to take into consideration the fluctuations and distortions so as to determine the true state of the result (Zivot & Andrew, 1992).

Table 4, show result of the bounds cointegration for the models used in this study. Given that the values of F-statistics for models 4, 6, 7, 8 and 9 are 3.38, 1.93, 1.775, 1.554 and 1.435 respectively are all lower than the lower and upper bound values at 10%, 5%, 2.5% and 1%. The result revealed that there is no cointegration; no long run relationships between the variables for models 4, 6, 7, 8 and 9. This means that the study only estimated the short-run ARDL and there are no long-run relationships.

Table 5 shows the relationship between BSSI and PCI, UNEM, LABOF. The result revealed that the outcome is free from auto-correlation and met the robustness checks of the model.

Table 6 shows the result of the relationships between the components of BSSI (BSI, BVI and ECI) and PCI, UNEM and LABOF.

## 4.3 Test of Hypotheses

### Hypothesis 1

Banking system stability is not related to per capita income.

From the table 5, the p-value of BSSI is 0.5461 which is higher than the significant level of 0.05. Therefore, the null hypothesis is upheld indicating that banking system stability is not related to per capita income.

### Hypothesis 2

Banking system stability is not related to unemployment rate

The result in table 5, revealed that p-value of BSSI is 0.0217 which is less than the significant level of 0.05. Hence, the null hypothesis is rejected, while the alternate accepted concluding that banking system stability is related to unemployment rate.

### Hypothesis 3

Banking system stability is not related to labor force participation

From the table 5, the p-value of BSSI is 0.6851 which is higher than the significant level of 0.05. Thus, the null hypothesis is upheld implying that banking system stability is not related to labor force participation.

## 5.0 Findings

### 5.1 Banking Vulnerability Index, Banking Soundness Index, Economic Climate Index and Aggregate Banking System Stability (BSSI)

The banking soundness index (BSI) and economic climate index (ECI) indicated a steady decreasing trend from 2000 to 2020. The ECI showed a slow decreasing trend compared to the BSI which decreased at a faster rate. They both had a fluctuation in 2006 first quarter till 2012 first quarter with ECI having a deep drop in 2009 first quarter.

Consequently, the BSSI showed a steady trend



with insignificant fluctuation in 2007 third quarter to 2012 first quarter. The period of fluctuations may be attributed to the 2007 and 2008 global financial crises, which exposed the weak monetary policy and implementation of the same in Nigeria and revealed the over dependence on foreign trade partners; USA, UK and China. The BSSI was largely driven by the BSI, which had to do more with improved capitalization of banks, liquidity and impressive profitability.

This suggests that local banks have thrived well even with dwindling economic climate and higher vulnerability due to poor external sector performances and consistently high inflation. If BVI and ECI had more weights in the determination of the BSSI, there would have been a trend of dismal performance in the banking system stability indices. Same would have also been the case if the banking industry had not been subjected to recapitalization during the period as this rightly boosted the BSI, which in turn introduced more stability in the system.

### **5.2 Labor Force Participation (LABOF) and Banking System Stability (BSSI)**

Results revealed that the banking system in Nigeria is stable and has resulted in a stable labor participation at approximately 55%. This is largely driven by increasing credits to the private sector strengthened by improved capitalization of the banks. The effect on labor force participation is insignificant because sectors which attract most of the credits are not labor intensive. Agriculture, which is a significant sector for driving labor, is not considered an attractive or profitable sector by banks to create risk assets. This is due to the relatively high risk involved, long term nature of the investments and lower returns on investment relative to other sectors like the Oil and Gas which however is not labor intensive. The banking industry can still do more on credit expansion if the development goal on labor force participation is to be realized. This will necessarily call for further recapitalization, leading to improvement in BSI, and ultimately a more stable banking system if the

consequential higher vulnerability is well managed.

### **5.3 Unemployment (UNEM) and Banking System Stability (BSSI)**

The results showed that between the first quarter of 2000 and the first quarter of 2003, the unemployment rate was stable. However, the unemployment rate dropped from 2003 second quarter up until 2004 first quarter before, it increased and remained stable till 2013 first quarter. The stability over this period is attributed to the recapitalization and the risk management policies of 2005 and 2010 respectively. However, 2015 first quarter witnessed consistent increase in the rate of unemployment which is as a result of the slow-down in the banking system stability index especially in the area of banking vulnerability index and economic climate index. These indices deal with external sectors and international trade performance respectively.

### **5.4 Per Capita Income (PCI) and Banking System Stability (BSSI)**

Results showed that BSSI has not been able to translate to a stable and steady increasing PCI. Between 2000 and 2004 first and fourth quarter respectively, the PCI growth was between 1% from the fourth quarter of 2004 to 2017 fourth quarter, PCI growth peaked at 3.2% but dropped to zero percent growth as at 2018 second quarter due to fears of country break-up and electoral violence. But in 2019 first quarter, PCI picked up and grew to 2.7%. Results confirmed mixed effects as explained by Ntarmah, Kong & Gyan (2019). Apparently the BVI and ECI weakened the BSSI and prevented it from translating into stable and increasing PCI. It does mean that bank profitability (which is a strong factor in BSI) is not a sufficient condition or explanation for improved PCI.

### **5.5 BSSI and PCI, UNEM, LABOF**

It can be seen from the results that effect of banking system stability on per capita income (PCI) is positive but has no significant effect. The implication is that BSSI does not guarantee

significant growth in the PCI in Nigeria. Also, BSSI rather than reduce the growth rate of unemployment in Nigeria, contributed significantly to it. This means that quiet laying off of bank staff in the banking sector may have significantly steadily increased the unemployment rate. Similarly, the increasing effect of unemployment growth has translated to the insignificant increase in the labor force participation in Nigeria even though BSSI is positive.

The effects on PCI, UNEM and LABOF are shown in the graphical relationships presented in figure 2, 3 and 4 respectively.

**5.6 BSSI (BSI, BVI and ECI), PCI, UNEM and LABOF**

For the first panel, BSI, BVI and ECI negatively affected PCI, while ECI positively affected PCI. For the second panel, the result showed that BSI and BVI positively influenced the growth of unemployment rate while ECI negatively affected unemployment rate. Again, the effect of BSI and BVI in the third panel are positively associated with labor force participation while ECI negatively influenced labor force participation. Given that all the p-values for BSI, BVI and ECI are greater than 0.05, their influences are insignificant to PCI, UNEM and LABOF.

**6.0 Conclusion and Recommendation**

Banking system stability is neither related to per

capita income nor labor force participation. Banking system stability is actually related to unemployment rate. There are mixed results in determining effects of banking system stability index on sustainable development. The methodology in assessing the index matters, but what is more important for developmental purposes is the conscious efforts in formulating developmental policies and effectiveness and efficiency of implementation. Banks should channel sufficient credit to the private sector, as this serves as the primer to focusing and implementing development initiatives.

Banking system stability index may not be an adequate or sufficient diagnostic check for realization of development goals. Consistently having a stable banking system is not a sufficient condition for achieving stable per capita income, labor force participation and employment level.

However, tinkering with some aspects of the methodology for determining banking system stability index may enable an alignment of the indices with realities in development performances. Economic Climate Index and Banking Vulnerability Index should be given more weights in determining the Banking System Stability Index. Also, economy is just one factor in sustainable development. Sustainability is more about the future. Other considerations such as society, environment and culture are pivotal.

**Tables**

Table 1  
Descriptive Statistics

	LABOF	PCI	UNEM	BSI	BVI	ECI	BSSI
Mean	55.02	1.79	4.83	1.00	1.02	0.99	1.01
Std Dev	0.15	0.89	2.00	0.02	0.03	0.01	0.01
Kurtosis	-0.88	-1.05	-0.19	-1.39	-1.22	1.58	1.35
Skewness	-0.60	-0.26	1.25	0.04	0.00	-0.75	0.72
Minimum	54.70	-0.03	2.76	0.96	0.97	0.94	1.00
Maximum	55.22	3.26	9.28	1.05	1.08	1.01	1.03
Count	84	84	84	84	84	84	84

Table 2: Correlation analysis

	LABOF	PCI	UNEM	BSI	BVI	ECI	BSSI
LABOF	1						
PCI	0.118538	1					
UNEM	0.628211	0.014967	1				
BSI	-0.53639	-0.51615	-0.73972	1			
				-			
BVI	0.565671	0.543624	0.78272	0.94275	1		
ECI	-0.34261	-0.30304	-0.48007	0.59751	-0.59989	1	
						-	
BSSI	0.401836	0.393332	0.558403	-0.4675	0.721597	0.15955	1

Table 3: Unit root Test with Zivot and Andrew with Structural Breaks and ADF

Variables	ADF p - value @Level	Break	Level of sig	ADF p - value @a1 <sup>st</sup> Difference	Break	Remark
PCI	0.6502	2011:01	0.05	0.0000	2002:01	Stationary at first difference
BSS	0.0001	2009:03	0.05	0.0001	2008:02	Stationary at Level
UNEM	0.0113	2015:01	0.05	0.0000	2015:01	Stationary at Level
LBOF	0.7997	2010:03	0.05	0.0001	2004:01	Stationary at first difference
BSI	0.1783	2010:03	0.05	0.0001	2011:03	Stationary at first difference
BVI	0.9900	2012:03	0.05	0.0001	2001:01	Stationary at first difference
ECI	0.0001	2007:02	0.05	0.0001	2011:01	Stationary at Level

Source: E views 10.0 Output

Table 4: Bound Tests of Co-integration

Models	F-statistic	Critical Value	I (0)	I (1)
Model 4	3.38 k=1	10%	4.04	4.78
		5%	4.94	5.73
		2.5%	5.77	6.68
		1%	6.84	7.84
Model 5	Not Applicable			
Model 6	1.93 k=1	10%	4.04	4.78
		5%	4.94	5.73
		2.5%	5.77	6.68
		1%	6.84	7.84
Model 7	1.775 k=3	10%	2.01	3.10
		5%	2.45	3.63
		2.5%	2.87	4.16
		1%	3.42	4.84

Model 8	1.554	10%	2.01	3.10
	k=3	5%	2.45	3.63
		2.5%	2.87	4.16
		1%	3.42	4.84
Model 9	1.435	10%	2.72	3.77
	k=3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61

Table 5: Short -run ARDL relationship between BSSI, PCI, UNEM and LABOF

Variables	D(PCI)		UNEM		D(LABOF)	
	Coeff	p-value	Coeff	p-value	Coeff	p-value
BSSI	4.030	0.5461	206.4	0.0217**	0.2101	0.6851
Durbin -Watson	2.08		0.353*		2.03	
R <sup>2</sup>	0.297		0.311		0.475	
N	80		84		80	

HAC\* = was corrected by estimating HAC (Gujarati & Porter, 2009)

Table 6: Short -run ARDL relationship between BSI, BVI, ECI, PCI, UNEM and LABOF

Variables	D(PCI)		D(UNEM)		D(LABOF)	
	Coeff	p-value	Coeff	p-value	Coeff	p-value
D(BSI)	-1.284	0.7495	0.633	0.8664	0.018	0.9509
D(BVI)	-6.619	0.5557	3.399	0.7408	0.063	0.9402
D(ECI)	7.002	0.2744	-2.747	0.6381	-0.052	0.9143
Durbin -Watson	2.08		2.10		2.03	
R <sup>2</sup>	0.315		0.352		0.482	
N	80		80		80	

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## Determining the Asymmetric Effect of Food Prices on Inflation in Nigeria



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### Abstract

*This study examines the linear and nonlinear effects of food prices on headline inflation in Nigeria using Panel Nonlinear Autoregressive Distributed Lag (PNARDL) model developed by Pesaran, Shin, and Smith (2001) and Shin, Yu, and Greenwood Nimmo (2014). The data span through March 2011 to May 2021. The results indicate a significant impact of food prices on headline inflation. It also confirms the downward rigidity of headline inflation. This is so, even for most states and the Federal Capital Territory. The study identifies that food prices remain part of the underlying pressures fueling inflation in Nigeria. This may be attributed to the overwhelming weight of food in the consumer price index basket. Consequently, the study strongly suggests the need for continuous rejigging of national policy towards boosting domestic food supply to moderate inflation. The ongoing CBN interventions in the agricultural sector, if sustained, harmonized, and restructured has the potential of becoming a 'game changer' in softening inflationary trend in Nigeria. The study also recommends that the National Bureau of Statistics (NBS) should consider revisiting the weight of food in the CPI basket in*

*response to the changing structure of the Nigerian economy.*

**Key Words:** Food prices, headline inflation, ARDL, NARDL, Nigeria.

### 1.0 Introduction

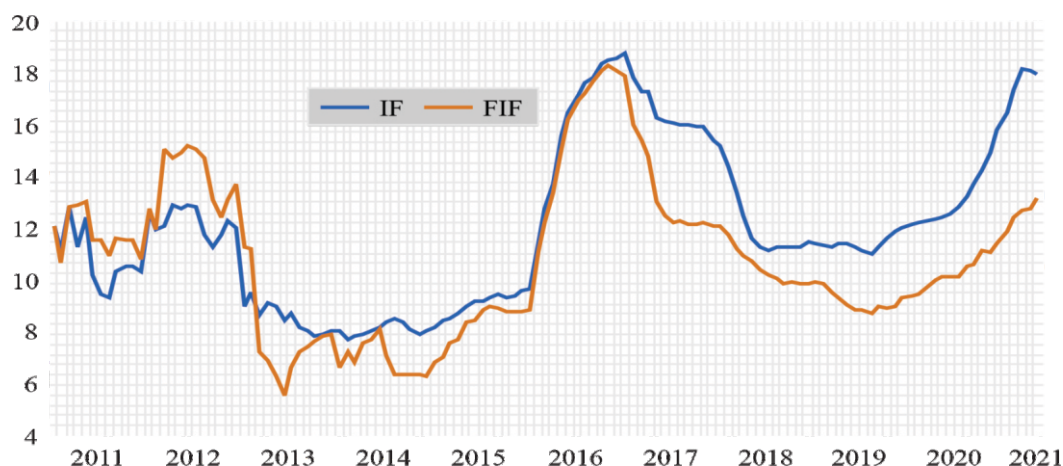
The primary macroeconomic concern of the Central Bank of Nigeria (CBN) in recent years is high and volatile inflation. Following the surge in inflation witnessed in the early part of 2011 and blamed on the increased food prices, the CBN took some policy measures to intervene in the domestic food production by launching several intervention programs in the agricultural sector. This helped to achieve single digit inflation rate in July and August 2011. The trend however reversed and peaked at 12.9 per cent in June 2012 and began to decline. With tight monetary policy and some additional food supply boosting measures by the CBN, the rate never hovered above the indicative single digit target until February 2016 when it rose to 11.4 per cent from 9.6 per cent recorded in January 2016. Policy makers, market watchers and analysts attributed increased food prices to the upturn in headline inflation. This claim was to be further supported by the recession which started in the first quarter of the same year - 2016. The economy gradually slipped into recession as it recorded a real GDP growth rate of -0.72, -1.67, -2.43 per cent in 2016Q1, Q2 and Q3, respectively.

With recession in place, the CBN became more concerned with stimulating economic activities to help the economy exit recession. In this regard, the Bank further embarked on aggressive monetary expansion through the unconventional monetary policy window which assisted the economy to crawl out of recession with 0.72 per cent growth rate in the 2017Q2. This notwithstanding, inflation continued to increase reaching the period height of 18.7 per cent in January 2017, mainly due to buildup in food prices. However, inflation began to moderate gradually to 11.9 per cent in November 2019. The period of moderation in inflation also coincided with restraint in food prices (Figure 1).

Africa's biggest economy further experienced another recession in 2020Q2, caused by global oil price crash blamed largely

on coronavirus pandemic (Bloomberg, 2021). Despite the pandemic, some observers still find blame on global and domestic food prices (Figure 2). Proponents of food prices as the drivers of inflation during the period of the second recession supported their stance with an

upsurge in the food price inflation from 9.3 per cent in December 2019 to 9.35 per cent in January 2020 which continued to 13.15 per cent in June 2021, although, the economy slothfully exited recession in 2020Q4.



**Figure 1:** Inflation and Food Inflation in Nigeria, 2011M1 to 2021M5

This evident downward stickiness of Nigeria's inflation rate is largely argued to be attributable to food prices arising from some structural rigidities in the economy. Those who hold this view believe that structural rigidities prevent inflation from falling, even when production improves as a result of monetary and fiscal policy measures. Other views lay blame on the global economy, contending that the recent inflationary

build-up in Nigeria reflects developments in the global economy, especially the sharp rise in global oil and food prices partly due to coronavirus pandemic. They argued that with food accounting for more than 50.0 per cent of the CPI basket in Nigeria, larger percentage of which are imported, these developments in the global economy easily filter into the domestic economy.



**Figure 2:** FAO Global Food Price Index



The authorities' policy response to these developments are in the meantime not too coherent since preference is given more to stimulating economic activities to avoid hurting growth (Emefiele, 2021). Moreso, if the views on the causes of the inflationary spiral as highlighted above are true and food prices are the major culprit, the Management of the CBN might be right in promoting food production to dampen food prices in the long run.

Efforts at solving the problem are largely unconventional. These involve the CBN intervention measures in various sectors of the economy. These are undoubtedly costly and difficult strategy to implement. There is therefore the need to be certain on the impact of food prices on the headline inflation as well as the channel of transmission. Moreso, the paper seeks to verify the effect of food prices on inflation from the perspectives of both linear and nonlinear modelling approach, using panel data on food price inflation and headline inflation across the thirty-six (36) states of the federation and the Federal Capital Territory (FCT) Abuja. The results show how headline inflation linearly and nonlinearly responds to food inflation in all the states of the federation including the FCT.

The paper is structured as follows: the introduction is followed by section 2 which highlights theoretical and empirical literature. The linear (ARDL) and Nonlinear Autoregressive Distributed Lag (NARDL) models adopted for the analysis is detailed in section 3 while section 4 discusses the empirical results, and section 5 concludes the paper.

## 2.0 Theoretical and Empirical Literature

### 2.1 Theoretical Literature

Economists mostly believe that changes in domestic food prices are functions of not only domestic factors but also some international developments (Rangasamy, 2010). Rise in the prices at the international level could also filter into the domestic economy in two ways. One, rising demand or falling supply or rising cost of inputs in the producing economies could bring about rise in prices, which in-turn result in

increasing price of export. Economists refer to this scenario as imported inflation. Secondly, changes in the strength of domestic currency can also precipitate changes in food prices. As the domestic currency depreciates, the monetary value of imported goods rises, even if the prices of the imported goods from the producing countries remain the same. The imported inflation and pass-through effect are both regarded as the open economy view and recently recognized also as the globalist view.

The monetarists still blame changes in food prices, to some extent, on money supply, believing that as nominal money supply grows, general price level is bound to follow suit including food prices. The monetarist view is well discussed in literature (see Tumala, Olubusoye, Yaaba, Yaya & Akanbi, 2018; Yaaba, Abubakar & Shaba, 2018; Salihu, Yaaba, & Hamman, 2018; Tumala, Olubusoye, Yaaba, Yaya & Akanbi, 2018; Yaaba, 2019). The structuralists however contend that, beyond money, some structural rigidities in the economy also fuel inflation. The proponents of this view foresee no problem, if expansion in money can be accompanied by growth in output.

This is however difficult to happen, hence inflationary pressures including food inflation. The fiscal theorists led by Leeper (1991), Sims (1994), Woodford (1994) formulated the fiscal theory of price level (FTPL). The proponents are of the view that as opposed to the monetarist view, inflation is a function of fiscal operations. They argued that unsustainable fiscal deficits will bring about deliberate government actions to induce inflation in future.

If government operates a persistent structural deficit that is unsustainable, such that future tax revenue is not sufficient to pay the ensued obligations, government will in the long-run increase borrowing. They therefore assert that fiscal discipline that is likely to entrench balanced budget is necessary for price stability

As food prices change, headline inflation, in most cases, follow suit, although, the overall impact of food price inflation on headline inflation may not necessarily be of the same proportion as the composition of food in the consumption basket (Rangasamy, 2010). Some food items may not exert the same level of inflationary pressures on

headline inflation. While some directly affect consumer prices, others play some degree of indirect influence on overall inflation. Now, considering that in Nigeria, like many other developing countries, foods attract the largest weight (above 50%) in the basket, it therefore follows that increase in food prices exert relatively more weight on the headline inflation. The indirect effect, otherwise referred to as the second-round effect, on the other hand, stemmed from the perspective of expectation. Beyond the weight of food in the CPI basket, there is also the effect arising from interlinkages between food and non-food prices making the understanding and frequent scrutiny of these linkages highly crucial.

## 2.2 Food and Headline Inflation: A Stylized Fact

As a result of the rise in food inflation of 8.71 percent, headline inflation for Nigeria in February 2009 was 14.6% despite the drop in core inflation to 10.42 percent. Food and core inflation both rose to 8.44 and 20.22 percent in October of the same year, resulting in headline inflation of 11.53 percent. It was not until March 2010 that headline inflation dropped by 5.35 percent, driven by both food and core inflation of 2.58 and 5.68 percent, respectively. When food prices spiked unexpectedly in the following month, headline inflation increased despite the fact that core inflation continued to fall. Headline Inflation was influenced by food prices throughout 2010, except for the month of November, which was influenced by core inflation rate, which fell by 10.80 percent. When food prices fell by 4.44 percent in April 2011, headline inflation fell by 11.64 percent, and it continued to drive headline inflation for three consecutive months in May, June, and July as well as September through November of that year. Only in August and December of the same year was core seen to be driving the headline, by 5.31 and 5.55 percent, respectively, in the third and fourth quarters of the same year. The result in 2013 result confirms that food is the main driver of Nigeria's headline inflation. There have been only two exceptions to this rule: June and December. In 2014, food inflation in Nigeria had a consistent impact on headline inflation. As a result of the subsequent decline in the food component of inflation, February, September, October, and November all saw a decline.

Similarly, the increase recorded was also due to the movement of 2014's food inflation. From January to August 2015, headline inflation rose steadily, with both food and core inflation contributing to the overall trend, except for September, November, and December 2015, when only food inflation contributed to the overall trend in headline inflation. 2016 witnessed upward swing throughout the year, with both food and core inflation factors contributing to the increase, except for December, when only food inflation was responsible for the rise. In 2017, the result was unique in that it was based on several factors that contributed to the overall inflation rate. In the months of February, April, June, July, and September, only core inflation impacted headline inflation. Although, the headline inflation rate declined steadily from November 2017 to November 2018 but reversed, with the headline inflation of 11.44 and the core inflation of 0.16, respectively. In 2019, the headline inflation rate was more stable, ranging from 11.37 to 11.98 from January to December. In the months of May and October of this year, there was a spike in food prices.

## 2.3 Empirical Literature

The extent to which food prices can influence headline inflation has long been a subject of research as a result of an unending debate surrounding the subject matter. From the early 1960s to late 1970s, economists attributed inflationary episodes in the developed countries of the UK, and the US largely to development in food prices (Blinder, 1982; Blinder & Rudd, 2008; Furceri, Loungani, Simon & Wachter, 2016). Blinder (1982), and Blinder & Rudd (2008) are of the view that the inflationary episode of the 1978 were a consequence of rise in food prices. These studies argued that although the two most prominent OPEC shocks, the twin contemporaneous food price shocks and the elimination of restrictions on wage prices of 1973/74 contributed to the great stagflation, increased money supply and excess aggregate demand played far less role than food prices.

They attributed the subsequent stability in prices in the US economy to remarkable decline in the composition of food in the US-CPI consumption basket arising from changes in the structure of the economy.

Furceri, Loungani, Simon & Wachter, (2016) adopted an eclectic approach to examine the impact of global food prices shock on domestic inflation in a large cross-country model. The study found that about 10% rise in global inflation, brings about 0.5% increase in the domestic inflation of developed countries after one year, although less persistent. They submitted however that the global food price shock of the 2000s impacted much higher on emerging market and developing countries (EMDCs) than the advanced economies. They attributed the differences to the variations in the weight of food in the consumption baskets of the two groups and the well anchored inflation expectations in the developed economies.

Using Granger causality in the frequency domain of Lemmens, Croux & Dekimpe (2008), Patnaik (2019) found thesecond-round effect of food inflation on headline inflation and confirmed not only the existence but also the prevalence of second round inflation effect. Thus, he advised the Reserve Bank of India to concentrate effort in anchoring inflation expectations via sufficiently effective communication as well as make frantic effort to enhance monetary policy credibility. Other earlier studies on India to this effect with similar results are Raj & Misra (2011); Nair & Eapen (2012); Guha & Priphati (2014); and Bhattacharya, & Gupta, (2015).

Using data spanning from 1971 through 2008, Rangasamy (2010) in eclectic framework found a significant role of food prices in South African inflationary episodes and particularly in the last decade of the study period. According to the author, although external influences counted but the role of domestic food prices matter most, implying the relevance of national policy in curbing the spiral. Ginn&Pourroy (2020) in a small open economy DSGE model within the framework of an alternative Taylor rule found that food inflation played a crucial role in determining monetary policy actions of Chile. Convinced on the role of food prices in the overall inflation, and in line with the Central Bank of Chile price stability commitment, the central bank adjusts upward the policy rate in response to food inflation.

There is paucity of literature on this subject matter

for Nigeria,however, closely related to this is the work of Tule, Salisu, & Chiemeké (2018) who used price of agricultural commodities to forecast Nigeria's inflation. They considered prices of 12 twelve major groups of agricultural commodities and individually and jointly used them to predict overall inflation. The study which adopted a varied technique found that prices of agricultural commodities individually or jointly predict very well boththe overall inflation and food inflation far better than the commonly used random walk models. The results, according to the authors highly improved with the use of acomposite index for agricultural commodities constructed through principal components approach.

Other studies on Nigeria with result supportive of the impact of food prices on headline inflation includes that of Moser (1995) who found Agroclimatic conditions as one of the factors that influenced headline inflation. Olomola (2013) attributed the 2008 food crisis in Nigeria that led to the period's inflationary episode to price rises in the world market among others.

### 3.0 Methodology, Estimation Procedure, and Data Issues

#### 3.1 Methodology and Estimation Procedure

The study used both Panel Autoregressive Distributed Lag (PARDL) and Panel Nonlinear Autoregressive Distributed Lag (PNARDL) models developed by Pesaran, Shin, and Smith (2001) and Shin, Yu, and Green-wood Nimmo (2014) to estimate both the long-run and short-run responses of all item prices to food price changes. We expressed the ARDL as a panel because both food prices and all items are computed across all the 36 states of the federation and FCT.

On the basis of nonstationary heterogeneous panel regression, we have created a panel regression variation that utilizes this model.According to Pesaran and Smith (1995) and Pesaran, Shin and Smith (2001), the generic form of the Panel ARDL model is given as:

$$y_{it} = \sum_{k=1}^p \lambda_{ik}y_{i,t-k} + \sum_{j=0}^q \theta'_{ij}X_{i,t-j} + \mu_i + \varepsilon_{it} \tag{1}$$

Where  $i = 1, \dots, N$  is the number of individual states,  $t$  is the number  $\mu_i$  of periods,  $\mu_i$  is the price effects,  $\varepsilon_{it}$  is the panel disturbance term,  $i, t$  is a

$K \times 1$  vector of explanatory variables,  $\theta_{ij}$  are the  $1 \times K$  coefficient vectors and  $\lambda_{ij}$  are scalars.

$$\Delta y_{it} = \rho_i(y_{i,t-1} - \phi_i' X_{it}) + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \theta_{ij}^* \Delta X_{i,t-j} + \mu_i + \varepsilon_{it}$$

where  $\rho = -(1 - \sum_{j=1}^p \lambda_{ij})$  is the speed of adjustment;

$\phi_i = \frac{\sum_{j=1}^p \lambda_{ij}}{(1 - \sum_{j=1}^p \lambda_{ij})}$  is a vector of long-run parameters, while

$\lambda_{ij}^* = -\sum_{m=j+1}^p \lambda_{im}$  and  $\theta_{ij}^* = -\sum_{m=j+1}^q \theta_{im}$  are the short-run parameters.

Under the prior assumption that the variables will return to a long-run equilibrium, this parameter is expected to be significantly negative (Blackburne & Frank, 2007). According to Equation (3), the estimable Linear PARDL model for this study is as follows:

$$\Delta P_{it} = \alpha_{0i} + \beta_{1i} P_{i,t-1} + \beta_{2i} F_{i,t-1} + \sum_{j=1}^M \theta_{1ij} \Delta P_{i,t-j} + \sum_{j=1}^N \theta_{2ij} \Delta F_{i,t-j} + \mu_i + \varepsilon_{ij} \quad (3)$$

where  $P_i$  is the inflation rate measured by the log of all items consumer price index for each unit  $i$ ;  $f$  denotes the food component of inflation measured by log of food consumer price index;  $\mu_i$  is the group-specific effect;  $i$  is the sampled units; and  $t$  is the number of periods.  $\mu_i$

For cross-section, the long run slope (elasticity) coefficients are computed as  $-\beta_{2i}/\beta_{1i}$ . This calculation is derived under the assumption that, in the long run,  $\Delta p = \Delta f = 0$ . This calculation is feasible if the model meets the convergence criteria, which can be assessed using the error correction representation for Equation (4).  $\theta_{2ij}$  This calculation is feasible if the model meets the convergence criteria, which can be assessed using the error correction representation for Equation (4).

$$\Delta P_{it} = w_i v_{i,t-1} + \sum_{j=1}^M \theta_{1ij} \Delta P_{i,t-j} + \sum_{j=1}^N \theta_{2ij} \Delta f_{i,t-j} + \mu_i + \varepsilon_{ij} \quad (4)$$

where  $v_{i,t-1} = P_{i,t-1} - \phi_{0i} - \phi_{1i} f_{t-1}$  is the unit's linear error correction term; the parameter  $w_i$  is the error-correcting speed of the adjustment term for each unit, which is expected to be negative and statistically significant. To find the nonlinear effect of food prices on inflation, we adopted a nonlinear version of the panel ARDL given as:

$$\Delta P_{it} = \alpha_{0i} + \beta_{1i} P_{i,t-1} + \beta_{2i}^+ f_{i,t-1} + \beta_{2i}^- f_{i,t-1} + \sum_{j=1}^M \theta_{1ij} \Delta P_{i,t-j} + \sum_{j=0}^N (\theta_{2ij}^+ \Delta f_{i,t-j} + \theta_{2ij}^- \Delta f_{i,t-j}) + \mu_i + \varepsilon_{ij} \quad (5)$$

where  $p_t^+$  and  $p_t^-$  denote positive and negative shocks, respectively, and are computed as positive and negative partial sum decompositions of food price changes and derived as: (see Shin et al., 2014):

$$p_t^+ = \sum_{k=1}^t \Delta p_{ik}^+ = \sum_{k=1}^t \max(\Delta p_{ik}, 0)$$

$$p_t^- = \sum_{k=1}^t \Delta p_{ik}^- = \sum_{k=1}^t \min(\Delta p_{ik}, 0)$$

Asymmetry occurs when the coefficients differ significantly but their impact on inflation is assumed to be the same. The MDG and the Pooled Middle Group estimators (PMGs) are both considered prominent estimators for dynamic panels that are not stationary or heterogeneous. As a result, Hausman technique is used to test the results of the estimators. The failure to accept the null hypothesis indicates suitability of PMG estimator, whereas the rejection indicates suitability of the MG estimator (Blackburne & Frank, 2007; Salisu & Isah, 2017; Salisu, Isah, Oyewole, & Akanni, 2017).

In line with equation (4), the error correction term of the equation is formulated as:

$$\Delta P_{it} = w_i v_{i,t-1} + \sum_{j=1}^M \theta_{1ij} \Delta P_{i,t-j} + \sum_{j=0}^N \theta_{2ij} \Delta P_{i,t-j}^+ + \sum_{j=0}^N \theta_{2ij} \Delta f_{i,t-j}^- + \mu_i + \varepsilon_{ij} \quad (6)$$

As in equation (4), the parameter  $w_i$  depicts the speed of adjustment back to equilibrium in case of distortion. It is expected to carry negative sign and statistically significant. The choice of panel ARDL is informed by several consideration (Pesaran, Shin and Smith (2001). First, the technique is amenable to slope heterogeneity common in the panel data with large T as is the case with the data set used in this study. Second, it allows the simultaneous retrieval of both long- and short-run parameters such that both can be evaluated through Wald Test of equality between the coefficients. Third, it accommodates I(0), I(1) or a mixture of both. While, in line with Shin, Yu and Green-wood Nimmo (2014) and Salisu & Ndako (2018) the panel NARDL as the strength of; one, capturing the dynamic error correction in the asymmetric long run cointegration equation, associated with NARDL. Two, in the same vein as ARDL, the existence of cointegration is feasible irrespective of whether the variables are I(0), I(1) or a mixture of both. Three, it makes possible the estimate of asymmetric cumulative dynamic multipliers to trace the possible asymmetric adjustment forms of positive and negative shocks to the predictor variables. Four, the technique is amenable to the handling of heterogeneity in the non-linear slope across the observed groups.

**3.2 Data Issues**

The data used for empirical analyses range from March 2011 to May 2021. For all items and food consumer price index, the data covered the thirty-six states of Nigeria and federal capital territory. In all, there are 4,514 observations and across 36 states and FCT. The data was sourced from the Nigerian National Bureau of Statistics web site.

1. Empirical Results

The descriptive statistics of the variables used for the estimation is presented as Table 2. Cursory

examination of the table reveals that there are four thousand five hundred and fourteen (4514) observations across thirty-seven (37) states including FCT, with maximum observation of 451.66 for all items and 477.45 for foods.

The mean and median observations stand at 225.78 and 199.92, and 199.92 and 195.08 for food and all items headline inflation), respectively. Both variables are positively skewed as food yields +0.68 while all items stand at +0.60. The probability values indicate that the variables are normally distributed.

Table1: Summary Statistics

Variable s	Mean	Media n	Max.	Min.	Std. Dev.	Ske w ness	Kurtosi s	JB	Prob .	Obs .
Food	225.78	199.92	477.45	0.00	90.03	0.68	2.38	417.00	0.00	4514
All Items	214.75	195.08	451.66	100.60	76.28	0.60	2.29	369.39	0.00	4514

Note: Max stands for maximum, Min is minimum, Std Dev. denotes standard deviation, JB connotes standard deviation, prob. Means probability and Obs. is observation

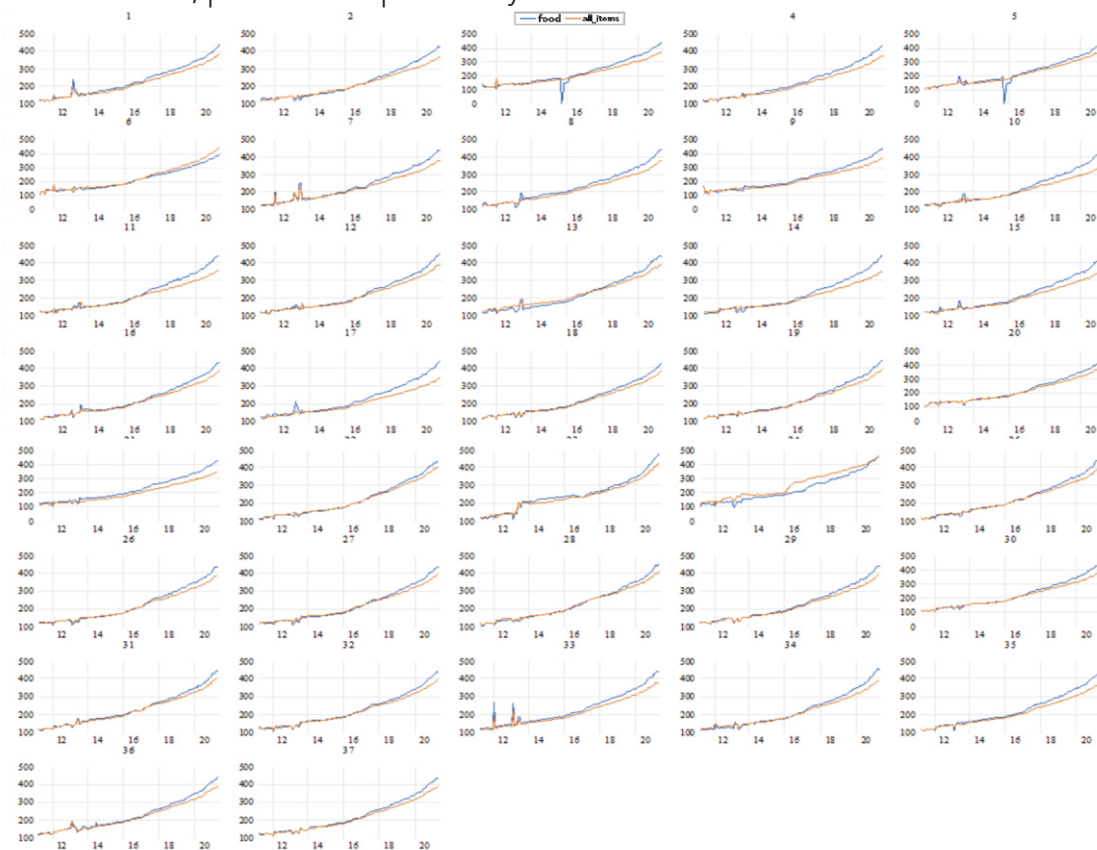


Figure 1: Trends in All-Items and Food Price Indexes across the 36 States of the Federation & FCT

Considering that ARDL and NARDL do not accommodate I(2) series, the variables were further subjected to unit root test using Augmented Dickey Fuller and Phillips-Perron (PP). The tests considered all the three available options in the test equation, namely: individual intercept, individual intercept and trend, and none. The lag length follows Akaike Information Criterion with

bartlett Kernel estimation and Newey-West bandwidth selection approach. The results of the test are presented as Table 2. Both food and all-items were reported as I(1) under individual intercept for Levin, Lin & Chu t\*; Im, Pesaran and Shin W-stat; ADF – Fisher Chi-square and PP – Fisher Chi-square. Thus, the adoption of ARDL and NARDL is proven to be valid.

Table 2: Panel Unit Root Test

All items						
	Indiv. Intercept		Indiv. Int. & Trend		None	
	Level	1 <sup>st</sup> Diff.	Level	1 <sup>st</sup> Diff.	Level	1 <sup>st</sup> Diff.
Null: Unit root (assumes common unit root process)						
Levin, Lin & Chu t*	33.979 2	9.26232** *	14.475 5	0.39912 23.003	34.720 7	1.61105
Breitung t-stat			4	-0.76273		
Null: Unit root (assumes individual unit root process)						
Im, Pesaran and Shin W-stat	36.390 5	- 14.7499** *	19.681 6	32.6179** *		
ADF – Fisher Chi-square	0.0148 1	619.183** *	0.6313 1	1053.46** *	0.0693 2	34.6871
PP – Fisher Chi-square	0.0295	2858.83** *	28.328 9	2613.48** *	0.0002 2	8637.23** *
Food						
	Indiv. Intercept		Indiv. Int. & Trend		None	
	Level	1 <sup>st</sup> Diff.	Level	1 <sup>st</sup> Diff.	Level	1 <sup>st</sup> Diff.
Null: Unit root (assumes common unit root process)						
Levin, Lin & Chu t*	37.402 2	19.9963** *	18.562 6	- 34.0934** *	36.607	- 5.70161** *
Breitung t-stat			26.127 1	- 5.53736** *		
Null: Unit root (assumes individual unit root process)						
Im, Pesaran and Shin W-stat	39.170 6	- 14.9574** *	23.191	- 49.6193** *		
ADF – Fisher Chi-square	0.0076 8	589.105** *	0.5968 1	1558.97** *	0.0036 4	550.363** *
PP – Fisher Chi-square	0.5357 4	2858.55** *	41.058 6	2574.21** *	0.0593 8	9423.5***

Note:\*\* Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

The correlation matrix which indicates the degree of correlation between the variables is reported as Table 3. The level of association between all-items and foods price indexes is reported as 0.985 or 98.5 percent and highly significant at 1.0 percent, indicating high association.

Table 3: Correlation Matrix

Variable	Food	All-items
Food	1.000	
All -Items	0.985 ***	1.000
No. of Obs.	4514	4514

Note: \*\*\*implies significant at 1%

Table 4 presents both panel ARDL and NARDL results. While the second column labelled (1) presents the results of the linear ARDL, the third and fourth columns labelled (2) and (3) indicate the results of the NARDL models for the Mean Group (MG) or Pooled Mean Group (PMG) estimators, respectively.

Close scrutiny of the table, with concentration on column 2 (the linear ARDL, labelled (2)) shows that food inflation, in the long-run, exerts statistically significant positive influence on headline inflation such that a 1.0 percent change in food inflation leads to 0.893 percent change in headline inflation. The influence is however lower in the short run as the magnitude of the coefficient although still positive but smaller (0.291).

Considering that the concept of sticky prices particularly for emerging markets and developing countries is argued to be only applicable to downward adjustment, the study applied NARDL

technique to examine the validity of the claim. To start with, the Hausman test result of 0.0108, significant at 1.0 percent favorsthe PMG technique hence it is recognized and treated as more preferred and thus analysis is centered on it.

Under the PMG result, the coefficient of positive changes in inflation (lfood\_p) is positive (0.898), statistically significant at 1.0 percent, and slightly higher than that of lfood(0.893) under linear technique. This implies that, like in the case of linear regression, positive changes in food prices (i.e., increase in food prices) induce increases in headline inflation. This is theoretically coherent and in tune with conventional wisdom.

Moreso, negative changes in food prices, indicating fall in food pricesalthough yields a positive and statistically significant coefficient in the long run, but relative smaller in magnitude when compared to its positive counterpart. In other words, the coefficient of lfood\_n is 0.371 compared to the 0.898 for lfood\_p. This indicates that as positive changes in food prices exert positive changes on headline inflation, so do negative changes in food prices negatively influence headline inflation but the magnitude varies significantly.

Interestingly, the short run result follows the same pattern with the long run. Positive changes to food prices (Dlfood\_p) returns a statistically significant positive coefficient (0.337) in the short-run, and negative changes in food prices (Dlfood\_n) also yields similar positive and significant coefficient (0.236). The difference is in the magnitude.

Table 4: Panel ARDL and NARDL Results

Dependent Variable : Lheadline			
	Linear	Non Linear	
Variables	(1) M g	(2) mg	(3) P mg
E <sub>c</sub>	-0.318*** (0.0253)	-0.426*** (0.0287)	-0.285*** (0.0268)
D.lfood	0.291*** (0.0410)		
D.lfood_ p		0.254*** (0.0336)	0.337*** (0.0352)
D.lfood_n		0.161** (0.0781)	0.236*** (0.0751)
Lfood	0.893*** (0.00748)		
lfood_p		0.858*** (0.0152)	0.898*** (0.00225)
lfood_n		0.806*** (0.0223)	0.371*** (0.00506)
Constant	0.168*** (0.0199)	2.036*** (0.136)	1.362*** (0.127)
Hausman	3.66 0.0558***		9.06 0.0108**
No. of States	37	37	37
Observations	4,471	4,305	4,305

Note: Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1; lall\_items and lfood imply logged all\_items and food prices respectively; lfood\_p and lfood\_n are respectively the positive and negative partial sums of lfood.

The results for both long and short run are supportive of the asymmetric effect of food prices movement on the headline inflation. This confirms the downward price rigidity for Nigeria.

The short run results of NARDL for all states is reported in Table 4. The table reveals evidence of cointegration for all states except for Ogun and Osun states in the case of NARDL. Furthermore,

the differences in the magnitude of the coefficients of positive (Dlfood\_p) and negative (Dlfood\_n) changes in food prices for states strongly corroborates downward price rigidity for Nigeria except for Adamawa state which yields negative coefficients in both cases, and Delta state in which case the coefficient of Dlfood\_n is negative.



**Table 4: Cross Section Short-Run Coefficients**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Variable</i>	Abia	Abuja	Adamawa	Akwa Ibom	Anambra	Bauchi	Bayelsa	Benue	Borno	Cross River
<b>ARDL</b>										
<i>ECM(-1)</i>	-0.067459*	-0.052893*	-0.154153*	-0.077481*	-0.061071*	-0.015418*	-0.214891*	-0.11318*	-0.281355*	-0.057015*
<i>ΔFood</i>	0.334478*	0.413704*	-0.099363*	0.620594*	0.016823*	0.473548*	0.547621*	0.27359*	0.225105*	0.349711*
<i>c</i>	2.2525	1.993269*	4.544252**	1.516018**	3.416048*	2.197494	3.993141**	2.769486*	4.588034*	1.578884*
<b>NARDL</b>										
<i>ECM(-1)</i>	-0.019078*	-0.012986*	-0.053599	-0.000959*	-0.03985*	-0.422369*	-0.01097*	-0.02315*	-0.010907*	-0.012586*
<i>ΔFood_p</i>	0.446491*	0.50197*	-0.052284*	0.770862*	0.036425*	0.225558**	0.771653*	0.35698*	0.653088*	0.413853*
<i>ΔFood_n</i>	0.298776*	0.33283*	-0.082148*	0.654608*	0.004916*	0.03795	0.655981*	0.241441*	0.443637*	0.374015*
<i>c</i>	3.0494**	1.854488**	8.100932	0.58647	5.057193**	40.88585	0.719219	2.746365*	1.780734	1.95598
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
<i>Variable</i>	Delta	Ebonyi	Edo	Ekiti	Enugu	Gombe	Imo	Jigawa	Kaduna	Kano
<b>ARDL</b>										
<i>ECM(-1)</i>	-0.13648*	-0.061921*	-0.084582*	-0.066045*	-0.106917*	-0.090274*	-0.040334*	-0.136573*	-0.216069*	-0.089936*
<i>ΔFood</i>	-0.161537	0.573319*	0.385208*	0.315299*	0.180581*	0.451358*	0.241944*	0.606523*	0.511474*	0.663279*
<i>c</i>	3.842182*	1.65922***	3.532147*	1.779108**	2.410518*	2.526806**	1.389576*	3.101013**	4.775467**	2.089231**
<b>NARDL</b>										
<i>ECM(-1)</i>	-0.032366*	-0.002066*	-0.015946*	-0.015875*	-0.019163*	-0.015012*	-0.012655*	-0.006167*	-0.009644*	-2.49E-05
<i>ΔFood_p</i>	0.538187*	0.725366*	0.450121*	0.506306*	0.366104*	0.528036*	0.272319*	0.698653*	0.734772*	0.74716*
<i>ΔFood_n</i>	-0.189394*	0.540479*	0.409882*	0.250903*	0.134689*	0.465446*	0.229313*	0.676688*	0.607665*	0.701554*
<i>c</i>	4.030752**	1.160244***	2.587935**	2.590799***	2.384999**	2.191252*	2.196169*	0.903611**	1.467051	0.21955
	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
<i>Variable</i>	Katsina	Kebbi	Kogi	Kwara	Lagos	Nasarawa	Niger	Ogun	Ondo	Osun
<b>ARDL</b>										
<i>ECM(-1)</i>	-0.057197*	-0.162256*	-0.220532*	-0.026922*	-0.056408*	-0.052405*	-0.067471*	-0.02331*	-0.061442*	-0.070482*
<i>ΔFood</i>	0.522295*	0.569776*	0.572357*	0.567429*	0.40467*	0.645992*	0.707793*	0.671722*	0.646945*	0.674643*
<i>c</i>	0.788833*	4.471418***	5.207842***	2.659059	2.324348**	1.557242**	1.918137	1.072554	1.566919**	1.560775
<b>NARDL</b>										
<i>ECM(-1)</i>	-0.005058*	-0.013637*	-0.005443*	-0.012738*	-0.01375*	-0.000337	-0.002976*	0.000257*	-0.003307*	0.002299*
<i>ΔFood_p</i>	0.616885*	0.720506*	0.745175*	0.593205*	0.46813*	0.770628*	0.813484*	0.68436*	0.684906*	0.802263*
<i>ΔFood_n</i>	0.541581*	0.599*	0.734989*	0.498058*	0.172814*	0.590311*	0.736468*	0.650006*	0.598899*	0.633829*
<i>c</i>	1.104654***	2.02426***	0.766005	2.328626	2.128283**	0.050638	0.077218	0.447756	0.73583***	-0.295797
	(31)	(32)	(33)	(34)	(35)	(36)	(37)			
<i>Variable</i>	Oyo	Plateau	Rivers	Sokoto	Taraba	Yobe	Zamfara			
<b>ARDL</b>										
<i>ECM(-1)</i>	-0.047418*	-0.111541*	-0.138537*	-0.114379*	-0.089539*	-0.392821*	-0.080067*			
<i>ΔFood</i>	0.611204*	0.670112*	0.507944*	0.318216*	0.440204*	0.194484*	0.610169*			
<i>c</i>	1.631208**	2.739351**	2.239056*	3.480864*	2.040537*	8.648172*	2.005434**			
<b>NARDL</b>										
<i>ECM(-1)</i>	-0.006938*	-0.003275*	-0.008258*	-0.019027*	-0.010027*	-0.026782*	-0.007516*			
<i>ΔFood_p</i>	0.658059*	0.802038*	0.606431*	0.526642*	0.504681*	0.659177*	0.687466*			
<i>ΔFood_n</i>	0.621362*	0.800651*	0.600614*	0.286348*	0.446739*	0.29968*	0.595091*			
<i>c</i>	1.257288**	-0.199914	1.168078	3.167031*	1.613564*	2.519995	1.114867*			

Note: \*, \*\* and \*\*\* implies significant at 10, 5 and 1%, respectively

#### 4.0 Conclusion and Policy Recommendations

The results indicate remarkable impact of food prices on headline inflation as well as confirm the downward rigidity of headline inflation. This is no surprising considering that the extant literature on pass-through to overall inflation from domestic food inflation provides that two key factors influence the effect of food prices on headline inflation namely: the weight of food items in the consumption basket and the anchoring of inflation expectation. The higher the weight of food in the consumption basket, the more likely the direct impact of food prices on overall inflation. As for expectation, to the extent that food prices

influence wages, pass-through to non-food prices is also highly anticipated given the relatively higher weight of food prices. In Nigeria with a poor track record of price stability, shock to food prices raises expectation of further future rise in inflation and when these expectations are reflected in prices, the pass-through becomes further stronger. The weight of food in the consumption basket in Nigeria is over 50 per cent, hence the preceding analogy suits fairly well the Nigerian situation. Overall, food prices can be said to be largely the cause of the underlying pressure on inflationary spiral in Nigeria. This is so even for most states of the federation and the FCT.

Consequently, the study strongly suggests the need for continuous rejigging of national policy towards boosting domestic food supply to tame the inflationary episodes. The ongoing CBN interventions scheme in the agricultural sector, if sustained, harmonized, and restructured has the potential of becoming a 'game changer' in lowering and stabilizing inflation in Nigeria. Further, there is the need for National Bureau of Statistics (NBS) that is statutorily saddled with the responsibility of compiling inflation statistics for the country to consider revisiting the weight of food in the CPI basket. The structure of the Nigerian economy has changed drastically and therefore the share of food in the CPI basket should be adjusted accordingly. It is our hope that the last Nigerian Living Standard Survey

(NLSS) conducted by the NBS in collaboration with the World Bank addresses this concern.

There is the need for the Central Bank of Nigeria (CBN) to vary, no matter how small, its responses to supply shocks. The CBN should focus more on core inflation. This will, to a large extent enable the Bank to gain credibility on inflation control. This approach has long been adopted in most developed and emerging economies including the UK (see Rogoff, 2003; Batini & Nelson, 2005 for detail). Besides, for sustenance, there is the need for a robust foreign exchange policy that ensures long time stability of the domestic currency to also curb the effect of the pass-through of imported food inflation.

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## Women Financial Inclusion in a Volatile Economy: Strategies and Prospects



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### Abstract

*The study examines women financial inclusion in a volatile economy, using North East and West as case study. Content analysis was employed in the analysis, based on secondary data. The study revealed that the financial exclusion rates in these areas are 50 per cent (NE) and 68 per cent (NW) whereby about 9 million women are excluded within this volatile region. Strategies such as triple synergy between NGOs, financial institutions and monetary authorities, modification of some of the intervention funds products, migrating phone lines to serve as account numbers, intensify effort on public awareness to mention but a few were suggested to be implemented. The study concluded that women financial inclusion will reduce poverty, improve income and increase output.*

### 1.0 Introduction

Financial inclusion has become an issue of urgent attention to both government and non-governmental organizations across the globe. This is a result of world leaders' desire or motivation to end the escalating world poverty which has stood at about 689 million persons, representing 9.2 per cent of the world living in extreme poverty of less than USD1.90 or less per day (World Vision, 2020). Among key factors that account for this development is lack of access to finance. However, at end of 2011, there are about 1.2 billion adults worldwide that were financially included and about 1.7 billion were still unbanked or financially excluded (Asil et al, 2017). From this figure, about 50 per cent of the financially excluded persons were mostly women in the rural areas or out of the workforce.

To address this anomaly, stakeholders deduced and adopted the Greeman Bank Model which is a micro credit system introduced by Mohammed Yunus (Akin-Fadeyi and Prochazka, 2018). The model is viewed as a financial inclusion drive and not just a banking model. As a result, the government of Nigeria has to key into it, in order to tackle the escalating financial exclusion rate because out of the 84.7 million adult population, about 39.2 million which represent 46.3 per cent were financially excluded in 2010 (EFInA, 2010). This cuts across the regions in the six geo-political zones namely, South East (31.9%), South West (33.1%), South-South (36.4%), North central (44.2%), North West (68.1%) and North East (68.3%). This further led to the development of the Nigeria Financial Inclusion Strategy (NFIS) which was launched in 2012.

A cursory look at the exclusion rate after the launch of the NFIS, according to the EFInA (2014) depicts thus, South East (25.4%), South West (24.8%), South-South (32.7%), North central (32.7%), North West (56.0%) and North East (68.4%). X-raying the performance showed that North West and East accounted for the poor performance. Recent

report by EFINA in 2021 showed that out of the financially excluded persons, about 50 percent were women, two-third lives in rural areas and were from Northern Nigeria. The Northern Nigeria, especially the North East and North-West, accounted for the high exclusion rate which points to the fact that the region has been in a volatile state due to activities of the insurgency and bandits. Other factors could be lack of financial access, low income, religion, among others.

However, several studies have been carried out on financial inclusion which include the works of Nisha et al (2021); Mahato and Goet (2021); Bashir et al (2020); Fahim (2020); Nawaz (2018); Bizah, Gambo and Magweva (2017); Achugamonu et al (2016), among others. These reviewed studies majorly focused on how Deposit Money Banks (DMBs), Microfinance Banks and agent banking has spurred financial inclusion generally. But little or no efforts have been made on gender-specific inclusion especially in a volatile region.

Therefore, with the gap that exists among gender in terms of financially excluded person where females accounted for the highest with about 40.9 per cent, compared to males with about 32.5 per cent necessitate the need to proffer strategies on how to achieve women inclusion rate in a volatile environment. Hence the need for this paper.

This paper is structured into five (5) sections. Section one covers introduction, while section two overview of current state of financial exclusion rate in the volatile region. Section three x-rays the strategies of achieving financial inclusion among women in this volatile environment while section four encapsulates the prospects of women financial inclusion in the volatile region concludes the paper.

**2.0 Overview of Current State of Financially Exclusion rate in the Volatile Region**

Nigeria currently has about 106 million adult population which about 63.1 million (63.3%) resides in rural areas, 49.9 million (50.1%) are

women out of which 40.9 per cent which accounts for 36.6M are financially excluded. Although, on the overall, Nigeria is yet to achieve the set target of having an exclusion rate of 20 per cent by the end of 2020 but there is a variance of 15.9 per cent. Consequently, the major focus areas in Nigeria's 2020 financial inclusion drive are presented in Table 2.

Table 2: Target and Focus Area in Nigeria Financial Inclusion

	Focus Area	Target	2010	2012	2014	2016	2018	2020
% of Total Adult Population	Payments (%)	70	22	20	24	38	40	45
	Savings (%)	60	24	25	32	36	24	32
	Credit (%)	40	2	2	3	3	2	3
	Insurance (%)	40	1	3	1	2	2	2
	Pension (%)	40	5	2	5	7	8	7
	Formally Served (%)	70	36.3	43.0	48.6	48.6	48.6	50.5

Source: EFINA, 2021

Table 2 depicts the major areas of focus for financial inclusion. Payments and Savings records a consistent increase from 2010-2020 where as credit, pension and insurance recorded a minimal increase, compared with target for 2020.

However, major drivers were used for financial service agents and digital financial services.

Looking at the volatile region within the context of Nigeria, the study focused on North East and North West which have been bedeviled with insecurity for over 10 years now thereby bringing about more poverty, unemployment, increased Internally Displaced Persons (IDPs), loss of lives and properties, among others. A snap shot of the state of this region can be presented in table 3

SN	Zone	Exclusion Rate (%)	Zone	Exclusion Rate (%)
1-7	North East	54.5	North West	62.4
	Gombe	76.1	Kano	75.2
	Bauchi	60.8	Jigawa	64.9
	Yobe	60.0	Kastina	64.0
	Adamawa	50.4	Zamfara	58.7
	Borno	48.6	Kaduna	54.9
	Taraba	30.9	Sokoto	54.8
-	0.00	Kebbi	44.4	

Source: EFINA, 2018

The data in table 2, revealed that North West, which has a total population of 23.9 million and is considered as a volatile region that has an exclusion rate of 62.4 per cent. The region has the

highest exclusion rate among other regions in the country. This is attributed largely to performances of states like Kano (75.2%), Jigawa (61.9%) and Kastina (64.0%) as their performances were above the regional average. On the other hand, the North East with a total adult population of 13.1 million has an exclusion rate of 54.5 per cent.

This is as a result of activities of states like Gombe (76.1%), Bauchi (60.8%) and Yobe (60.0%). At the end of 2020, snapshots of the financial exclusion rate of the regions were:

Table 4: 2020 Financial Exclusion Rate at Glance

Zone	Exclusion Rate (%)	Zone	Exclusion Rate (%)
North East	50	North West	68

Source: EFInA, 2021

Table 4, showed that the exclusion rate for North East recorded a reduction of 4.5 per cent while that of the North West witnessed an increase of 5.6 per cent, compared to 2018 performance.

With this performance, it entails that the 2020 target of having an exclusion rate of 20 per cent cannot be achieved and key persons that have been excluded were women, persons from Northern Nigeria, individuals living in the rural areas and youth. These coupled with the fact that some key challenges such as institutional exclusion, affordability, access and low awareness exist (EFInA, 2021). Additionally, the exclusion rate among women within this volatile environment can be presented thus:

Table 5: Women Financially Excluded in this Volatile Economy

Region	North East	North West	Total
Total Adult Population (Million)	13.1	23.9	37
Financially Excluded (Million)	7.1	14.1	21.2
Female Financial Excluded@ 40%(Million)	2.84	5.88	8.72

Source: Authors Computation, 2021

Table 5, showed that an estimated number of 3 million women are financially excluded in the North East while about 6 million in the North West. Thus, making it a total of 9 million women

excluded within this volatile economy. This poses a question on how can this large chunk of women be included financially?

### 3.0 Strategies for achieving Financial Inclusion among Women in the Volatile Environment

Based on the huge number of women that are financially excluded within this volatile region, there is need to co-opt or include them into the financial system.

#### Below are the strategies to adopt by stakeholders:

Triple Synergy between Non-Governmental Organization, Financial Institutions and Relevant Monetary authorities: The role of NGOs in a volatile environment cannot be relegated to the background as they are charged with the responsibilities of assisting the vulnerable especially, women and children. By so doing, they tend to be closer to the people at the grass root, thus, making them to have vital information or data on this category of persons. Therefore, by establishing a synergy between NGOs and DMBs while the CBN plays a moderating role, it could lead to data sharing which would lead to possible account opening in favour of these persons especially, women, thus reducing the rate of their financial exclusion.

Modification of Some of the Interventions Funds Products: The intervention funds introduced by the CBN is a right step in the right direction. However, certain products especially the Youth intervention scheme need to be modified to co-opt a "one-for- all package", especially those youths that intend to go in for the agency businesses. Since most youths especially those in the rural areas that intends to go in for this business lack the requisite capital to operate or start up. The "one-for-all package" implies that they will have access to the agency infrastructure and working capital at once so that repayment will be from their earnings. By so doing, it will result in the widespread of agents across these rural areas within the communities of this volatile environment. Thus, addressing issues of financial

access, women financial exclusion since these agents can perform certain vital role a bank performs.

**Encouraging State Government to Re-open their Microfinance Banks:** Most micro finance banks in these volatile areas are owned and controlled by their various states or local governments. The re-opening of these banks in the resettled areas is cogent because privately owned microfinance banks will not be willing to commence operations because of the risk involved in re-opening their closed branches. Such actions of the states or local governments would go a long way to make financial access much easier and exclusion would be reduced. This strategy is against the background that 81 percent of the financially excluded persons reside in the rural areas (EFInA, 2021).

**Migrating Phone Lines to Serves as Account Numbers:** With the latest development in the country's Information and Communication Technology (ICT) where National Identity Numbers (NIN) are linked to phone lines and Bank Verification Numbers (BVN) are also tied to phone lines. It makes banking easier if these databases can be synchronized with the help of telecom service providers and banks through a dedicated portal. By these, a 10-digit number of phone lines could serve as account numbers if certain short message service (SMS) code with preferred bank name is sent to the telecom providers. Once it is sent, the 10-digit number of the phone line will automatically be activated as an account number which can be either Tier 1 or 2 type of account. By so doing, the subscribers can immediately make cash deposits but withdrawals can only be entertained upon full regularization.

Consequently, implementing this strategy would reduce banking bureaucracy, make financial access easier, especially for the category of women living in the suburb areas of these volatile regions and hence, leading to a reduction in financial exclusion rate.

**Micro Credit Disbursement:** Micro credit is considered as a cogent tool in alleviating poverty

among the needy, especially those in the rural areas. The continued disbursement of this nature of credit could attract the financially excluded persons into the system. This is achievable if condition precedent to disbursement will be that beneficiary must have account with any of the DMBs or Microfinance banks. This is against the backdrop of the EFInA report for 2021 over the years where credit that have a target of 40 per cent but only succeeded in having the following rate as thus: 2010 (2%); 2012 (2%); 2014 (3%); 2016 (3%); 2018 (2%); and 2020 (2%). This reveals that there is a gap of 38 per cent against the 40 per cent target. Therefore, improving micro credit will result to double-barred achievement, that is achieving the credit target and at the same time reducing financial exclusion rate, especially for women.

**Intensify Effort on Public Awareness:** This stem out from the fact that 82 per cent of Nigerians are not aware of the formal financial access point close to their homes according to the EFInA 2021 report. Consequently, public awareness as per financial literacy is still at its low ebb despite the cash-less policy campaign, especially in the rural areas. However, stakeholders must ensure that their efforts are consistent most especially by establishing synergy with media houses so that relevant information can penetrate the nooks and crannies of these rural areas. More so, these can be done through the use of radios, pamphlets in different local dialects, community, trade association and even having ambassadors in each ward, districts, local government and state that could coordinate such drive. Additionally, synergy can also be established with religious scholars as they need to emphasis on the need for women participation in formal financial transactions.

**Boasting Women Entrepreneurship:** This could be considered as a way of boarding the financial excluded persons, particularly women. Women participation in entrepreneurship is too low owing to certain factors like tradition and religion in most cases. This has further worsened the exclusion situation, especially in the Northern part of the



country. With adequate training and skills acquisition programme put in place, coupled with disbursement of start-up or seed capital into their various accounts and with the registration of their businesses formally to enable them benefit from subsequent interventions, this would go a long way to reduce the exclusion rate in the volatile areas.

#### **Leveraging Agency Banking & Digital Banking:**

The penetration of agency banking in the economy of Nigeria is still below the expected target in achieving the targeted financial inclusion rate. Available statistics have shown that there is a gap of over 300,000 agents to achieve the 500,000-set target (Innovectics, 2018). Consequently, volatile areas have accounted for low performance. Therefore, flooding in such areas with more agents especially, Islamic agents will address some of the issues faced by some of the conventional agency banking system in the Northern part of the country. This would result to an increase inclusion rate, especially among female Muslims. This was demonstrated in the EFINA report for 2020 where banking agents constituted 45 percent of the drivers of inclusion, especially in the rural areas.

Additionally, with the series of innovation especially in the ICT sector, more emphasis can also be placed on digital banking as this could serve as a quick win for the conversion of the financially excluded women as depicted in the EFINA report 2021 whereby about 60 percent of the adult with digital accounts use digital services.

#### **Full Scale Implementation of the Non-Interest Intervention Fund:**

The CBN in 2020 rolled out the non-interest intervention funds products alongside its guidelines so as to take care of the yearnings among the Muslims due to the fact that the existing conventional system is not in conformity with their religious belief. With the full implementation of the scheme, it will go a long way to improve the inclusion rate in these volatile environments which constitute core Northern part of the country especially among women since

there are specific incentive for women entrepreneurs.

#### **Developing Specific Products for Low-Income Women:**

This strategy will go a long way in improving the financial inclusion rate among rural women if adopted by banks and non-banks especially microfinance banks operating in these volatile areas. Although, some DMBs like Access Bank (W-Initiative); Sterling Bank (One-Woman); First Bank (FirstGem); Zenith Bank (Z-Woman); among others have women specific products but the qualifying criteria is not suitable for low-income earners, thus, the need to develop a specific product that will take care of the low-income earners that are predominantly women who constitute large chunk of the financially excluded.

#### **Creating Adequate Legal and Regulatory Framework:**

Inadequate legal and regulatory framework is considered as an issue especially to the women folks in this volatile region as the existing frameworks are not in favour of them. For instance, the Nigeria law has to some extent favoured discrimination as regards employment based on gender, it is illegal for women to work overnight in labour-intensive kind of job, they are also not allowed in some industries to perform task as men, among others (Alexandra and Jack, 2019). This has served as a limitation to the women in contributing to the development of these regions and the country at large.

Additionally, available reports have shown that these restrictions have resulted to less women participation in the labour market; Women are unemployed, compared with men. They are over-represented in the informal sector and are paid less, compared with men. They have less access to social protection, less access to financial institutions or have bank account, among others (UN Women, 2018; ILO, 2018). This is supported by the Council for Foreign Relations (CFR) Women's Workplace Equality Index (2018) where Nigeria was ranked Nigeria 87<sup>th</sup> globally with a

score of 67.4 and the World Bank Report on Women, Business and the Law Index (2022) where it further ranked Nigeria with a score of 63.1. Therefore, removing the bottlenecks that resulted to these issues would go along to boost the morale of women thus, leading to their being financially included in the system.

#### **Leveraging Agency Insurance Model:**

Participation rate in the insurance business is low, especially within these volatile areas due to poor awareness, religious belief among other factors. This was better demonstrated by EFINA 2021 report where the sector achieved between 1-3 per cent as against the NFIS target of 40 per cent, thus, creating a gap of 37-38 per cent from 2010-2020. Therefore, adopting an agency insurance model just like the agency banking, especially within the framework of Islamic finance, it will go a long way in taking insurance businesses to the doorstep of these rural dwellers, particularly to women. This would result to an increase inclusion rate.

#### **4.0 Prospects of Women Financial Inclusion within this Volatile Region.**

Women occupies a large chunk of the population of Nigeria, constituting about 50 percent to the male counterparts even in these volatile states but the irony of it is that a large number of these female are financially excluded. Consequently, with the strict implementation of these strategies, it has some prospects on the women and volatile region.

By including females financially in this region of the economy, which are considered among states with the high poverty headcount rate (National Bureau of Statistics, 2019), especially among the rural

dwellers, could serve as a boast towards the reduction of poverty and increased standard of living among women. They will now have access to financial services, especially credits which invariably will directly or indirectly boost their level of income. This would go a long way to also create employment among female in these areas. By gaining financial access, they will benefit from interventions of government aimed at empowering them. This would make them to be employed because with such interventions they can set up their own micro, small and medium businesses and thus, generate income as well as, create wealth for themselves. Additionally, by gaining access to financial services especially credit due to financial inclusion, this would assist them to set up their businesses and become self-reliance, thus boost the development of SMEs within these volatile areas, lead to an increase in output thereby boosting the GDP of the economy.

#### **5.0 Conclusion**

The role of women in a volatile economy is too cogent to be neglected hence, their cash-less inclusion in such a system is important. Despite all the campaigns by relevant stakeholders especially, on the cash-less policy drive the inclusion rate of women has been reducing marginally.

However, the implementation of these strategies would assist in reducing the women exclusion rate and invariably reduce poverty, increase income, create employment and increase output of these volatile areas, in particular and the country in general.

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## An Assessment of The Impact of African Continental Free Trade Area on Nigerian Economy



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### Abstract

*This paper examines how the African Continental Free Trade Area (AfCFTA) has affected the Nigerian economy. A new trade agreement establishing the African Continental Free Trade Area was signed at a summit of AU leaders in Rwanda on March 21, 2018. The AfCFTA's official launch marks an important turning point for future continental unification, regional integration, and stronger economic relations and growth. This agreement also puts member states, including Nigeria, in a strong position to maximize the economic benefits that result from it. The study fits into the Neo-functional framework, which emphasizes that integration and collaboration in one area will eventually have a ripple impact on other aspects of regional integration. The methodology used for the task was a qualitative research method. Data was gathered from previously published works, while the analysis was done using a qualitative content analysis method. According to the study, primary products account for most of Africa's and Nigeria's export profits, which do not effectively substitute for imports. The study, therefore, advised African nations, especially Nigeria, to diversify their economies, increase exports to finance investment, increase their investment in infrastructure development, and that there is a strong, patriotic, and*

*nationalistic leadership that will fight corruption and ensure regional integration in order to help her have a formidable position in the global economy.*

**Key Words: International Trade, Continental Trade, Regional Integration, and African Continental Free Trade Area**

### 1.0 INTRODUCTION

The Organization of African Unity (OAU), now the African Union (AU), was founded as a unifying political organisation. However, over time, particularly in the 2000s, with the OAU's metamorphosis into the AU, the focus shifted from politics to economics. All fifty-four of the continent's nation-states share the demand for improved government and a better life. Two general characteristics are what catches the eye. It is true that certain nations are languishing in poverty and have meagre per capita incomes, while others have advanced in development and industrialisation.

The Congo/DRC, Ethiopia, Kenya, Sudan, Tanzania, and Uganda are the only five other nations, in addition to Nigeria that has a solid desire to industrialise. Sixty-one per cent of all Africans south of the Sahara reside in these eight nations. The remaining 46 are minor, with twelve mini-states having less than two million population. Some of them, like Nigeria, which Economy Watch (2010) estimates will have 205 million people by 2020, which makes up nearly one in five (Economy Watch, 2010).

Despite its impressive oil production, Nigeria, which has the most significant population in Africa, is one of the poorest nations, with a per capita income of barely \$400 in 2019. (ADB, 2020). Senegal, Zimbabwe, Swaziland, Cote d'Ivoire, the Democratic Republic of the Congo, Cameroon, Botswana, Gabon, and South Africa are among Africa's so-called "middle-income" nations. However, most of the people in these "middle income" countries are frequently not better off than their apparent poorer neighbours, with the exception of South Africa and its close neighbours and the partial exception of Cote d'Ivoire. Most "middle income" countries are mineral exporters,

with their per capita income figures boosted by the value of the oil and other minerals that the big transnational corporations extract and export from them (Global Trade Atlas Report, 2020).

Even in nations that export significant amounts of minerals, most of Africa still relies heavily on an agricultural cycle that is highly reliant on unpredictable weather. Growing population pressure results in an ever-growing landless labour force that is partially employed for subsistence wages on other people's land, partially unemployed or underemployed in urban areas, and occasionally migrates to neighbouring nations (e.g., from Burkina Faso to Cote d'Ivoire). These workers live on meagre incomes and receive only bare-bones public services, such as education and health care.

After a brief period of optimism in the middle of the 1990s, nobody now expects to see the GDP grow by the agreed-upon 5% annually, which is required for any meaningful poverty reduction (given the subcontinent's average population growth of 2.7%), let alone any hope of even starting to close the gap with the industrialised (or post-industrial) world (Polanyi, 2020).

Approximately 50% of the population (of Africa) is believed to be living in absolute poverty, according to the Economic Commission for Africa. This percentage is anticipated to rise at the start of the next millennium; therefore, African nations will need to create seventeen million new jobs annually to keep the unemployment rate current (Economy Watch, 2020:67).

Even while the ADB Report (2018) made every attempt to highlight specific positive developments, the general tone of the report remained depressing, which many of the issues mentioned above can be linked to the integration of African economies into the global capitalist economy as well as some outside factors like neo-colonialism, excessive meddling in African politics, and the exploitative practices of multinational corporations and foreign direct

investment concerns, among others. Africa's economic progress has also been impacted by internal issues like a monocultural economy, an overburdened government, corruption, poor leadership, and attitudes of all kinds.

African decision-makers and leaders have long acknowledged the significance of regional economic integration as a method of accelerating and consolidating economic and social growth. Although the first motivation was typically to increase one's political voice and influence in the international community, the desire for integration has deep roots in African history (Global Trade Atlas Report, 2012). The necessity of integration has once again taken centre stage as the challenges of globalisation and interdependence, including a possible marginalisation of the African continent, become apparent to the nations of the African region.

According to the AfCFTA Report (2020), the African Continental Free Trade Area (AfCFTA) is the most ambitious integration project on the African continent. It is a component of the African Union's Agenda 2063. It has as its primary goal the expansion of intra-African trade as well as the improvement of competitiveness and support for economic transformation in Africa. Through improved harmonisation and coordination of trade liberalisation, it is anticipated that the AfCFTA will raise intra-African trade from its current level of roughly 13% to 25% or more (AfCFTA Report, 2020). The Protocol on the Free Movement of Persons and Goods and the associated Single African Air Transport Market will propel this.

Africa was thrilled when the African Union (AU) Heads of State and Government decided to establish the AfCFTA at their 18th Ordinary Session. As nations signed the protocols and made preparations for its operationalisation in January 2021, the excitement became stronger. By January 2021, all African nations—except

Eritrea—had signed the AfCFTA agreement, and 54 national governments had legally committed to its formation. The 54 AU Member States have so far accepted the AfCFTA agreement, except Eritrea.

The extraordinary AU summit on the AfCFTA, held in Niamey on July 7, 2019, officially began the AfCFTA's operational phase by agreeing that trading under the agreement would begin on July 1, 2020, and by choosing Accra, Ghana, to host the AfCFTA Secretariat. The AfCFTA entered into force on May 30, 2019, but it was not until that day that the operational phase of the agreement was officially launched (AU, 2019).

Being the most populous country in Africa gives Nigeria a unique position regarding economic integration. The AfCFTA has the potential to turn Nigeria into Africa's trading hub, serving as the continent's economic hub and a key conduit for trade with the rest of the globe. The Nigerian government has overseen a significant investment in infrastructure, including the construction of roads, railways, and improved port facilities, all of which are intended to connect Nigeria more effectively with the rest of the continent and, consequently, advance the development of the nation. While Nigeria's exports to its neighbouring African nations have, in some cases, increased by twofold recently, the absolute amounts are still very high.

The main objective of this paper is to examine the impact of ACFTA on the Nigerian economy. the specific objectives of this paper are: to examine the role of diversification in the growth of Nigeria's economy, to assess the extent to which exports can be boosted to finance investment in Nigeria and Africa in general, to analyze the role of leadership recruitment process in the development of member countries particular Nigeria and lastly, to ascertain the negative effect of corruption on the development of Nigeria and Africa in general.

## 2.0 CONCEPTUAL AND THEORETICAL FRAMEWORK

### International Trade

A definition of international trade is the beneficial exchange of goods and services between two or more nations. Trade is the "engine of growth" acknowledged by classical and neo-classical economists. This is thus because commerce fosters development and expansion through technology, foreign investment, and other advantages of cross-border capital flows (Irwin, 2008).

According to Krugment and Obsfeld (2009), nations trade because they have various resource endowments and can profit from it by exchanging items in which each nation specialises in the activities it does well. Similar to this, nations engage in trade to attain economies of scale. Because of this, any nation may create more effectively if it focuses on creating the goods over which it has a comparative advantage rather than producing everything it requires.

Guardian Business News (2011) puts forth the concepts of absolute and comparative advantages: a nation benefits from trade if it specialises in producing goods and services with a competitive advantage. The theoretical foundation for these trade-related presumptions can be found in Smith and Ricardo (2010) and Samuelson (2000), who represent the Neo-Classical Trade Theory, developed on the ideas of Richardson and suggested that the difference in factor mobility between nations will eventually lead to an equivalence of the variable factor returns among trading nations. They contend that a nation will benefit from trade if it focuses on producing goods that utilise factors of production that are more intensively used and less expensive than others and imports commodities from other nations that can be produced more affordably. However, over time, all returns will equalise, and trade will benefit both countries (Fan & Breska, 2011).

According to Samuelson, as cited by Kayizzi (2019), international trade is exchanging money, goods, and services across international borders or regions. Such trade contributes significantly to the gross domestic product of the majority of nations (GDP). International trade has existed throughout history, but its economic, social, and political significance has grown in recent decades. It is the transfer of products and services between countries around the world.

Therefore, the term "international trade relations" refers to any trade or commerce that takes place between two or more nations. Trade occurs because nations are unique from one another. Countries can profit from their differences by agreeing on what each accomplishes or is naturally endowed (Husted & Melvin, 2007). Domestic trade, which occurs within a nation and employs the local currency, is distinct from international trade. Therefore, a global economic relationship makes materials and processes accessible that are not even conceivable in one limited country alone.

Global commerce has evolved into a plan for boosting the domestic economy over time (Perry, 2014). The exchange of surplus and limited goods has grown to be a particularly effective practice because no country has all the material and human resources necessary to guarantee an effortless living. From the standpoint of how it helps advance social and international relations, international trade is considered to be of utmost importance.

#### Continental Trade

Continental trade is the movement of commodities and services, including capital assets, between nations on a continent. Polanyi (2020), who defined it as trade across continental boundaries, agreed with this description. Such trade contributes significantly to the gross domestic product of the majority of nations (GDP). Although continental commerce has existed for a very long time, it has become increasingly significant in economics, society, and politics in

recent decades. Therefore, without continental and global trade, countries could only export the goods and services generated on their soil.

The World Bank Report (2014), however, adds that the difference between continental and domestic trade is that the latter is less expensive. This is because cross-border trade involves additional fees or costs, such as taxes and other costs related to cultural, linguistic, or legal differences between countries. Factors of production like labour and capital often move more freely inside a nation than across nations. Therefore, these factors honestly give business individuals and organisations a distinct polarisation of the two conceptions.

#### Neo-functional Theory

This study is positioned within the theoretical frameworks of Leon Lindberg's work on neo-functional theory and those of Ernst B. Haas, Hyman, and others from 2003. The neo-functional theory is the theoretical framework employed in this research to analyse the effects of the African economy on the Nigerian economy. The neo-functional theory holds that people with specialised knowledge and skills must take the lead in regional integration because the complexity of the difficulties nations face is mainly technological.

Neo-theory functionalism is centred on the idea of "spillover," according to Pfaltzgraff & Dougherty (2018). This group of presumptions is the foundation for the original neo-functional explanation of the European integration process. The concept of "spillover" effectively captures its understanding of change. The phrase was first used in two unique ways: (1) as a kind of shorthand for summarising the occurrence of (further) integration; and (2) to denote the impetus and underlying logic of integration via growing functional/economic interdependence.

The advice Has issues to governments not to give up on cooperative efforts in a tumultuous world with conflicting organisational actor views are also



crucial to understanding his work (Pfaltzgraft & Dougherty, 2018). This proves that Haas knows states could pursue relative gains and zero-sum games. In light of this, Haas agrees that his earlier theory of regional integration should be replaced by a comprehensive theory of interdependence (Pfaltzgraft & Dougherty, 2018). However, in reality, the construction of regional integration assumes that the governments within a region are aware of how closely related their economic fortunes are.

Successful teamwork initiatives founded on interdependence and supported by regional group formation and functional linkages would, therefore, result in what Haas refers to as "spillover," which is a reorientation of Mitrany's concept of ramification. The idea of spillover continues to be crucial to Haas' work.

The neo-functionalist theory is pertinent to the discussion because other integration processes were intended to follow suit. The goal behind the OAU becoming the AU was for the organisation to evolve towards economic issues, much like the EU. This was in addition to the political integration of the OAU.

### **The African Continental Free Trade Area And Nigeria's Economy**

For member nations, particularly Nigeria, the African Continental Free Trade Area is primarily regarded as a critical engine for economic growth, industrialisation, and sustainable economic development. Despite the opportunities it offers Nigeria, problems must be solved. Fears of significant losses in tariff income and unequal distribution of costs and benefits are a couple of the difficulties facing the continent's integration.

For a just distribution of costs and benefits, to minimize adjustment costs, and to fully realize the long-term benefits of the CFTA, flanking measures and flexibilities should be investigated. The AFCFTA's trade liberalisation reduces trade costs over time and gives customers access to a broader range of goods at cheaper pricing. The

development of regional value chains is encouraged by lower costs for imported intermediate inputs and raw materials, which boosts the competitiveness of downstream firms (AfCFTA Report, 2020).

One of the critical elements of the AfCFTA is trade liberalisation, which also gives Nigerian businesses access to a sizable continental market and the chance to take advantage of economies of scale. Long-term, more competitive pressures might raise company efficiency. However, when smaller businesses face more intense rivalry, there may be market consolidation. While the majority of the potential advantages of trade liberalisation are likely to materialize over the long term, structural change brought about by the migration of labour, capital, and other production elements has costs associated with it in the short term.

AfCFTA promotes continental free trade to eradicate slavery, colonialism, and neocolonialism. AfCFTA cannot accomplish its objectives because of its exclusive concentration on continental Africa, lack of interest in systemic redistribution, and encouragement of private appropriation of socially produced land rents. AfCFTA might even increase inequality progress alongside poverty and so undercut the fundamental principles of this trading system. A more effective and hopeful strategy for advancing the pan-African agenda is what Henry George (1886) dubbed "genuine free trade," a theory centred on socialising land rent in order to make land familiar. Only genuine free trade can genuinely end colonialism in international trade.

Despite the COVID-19 epidemic and other early difficulties, African nations opened their markets on January 1, 2021, allowing cross-border duty-free trade in goods and services. With a combined GDP of \$3.4 trillion, the new market anticipated to be established by the African Continental Free Trade Area AfCFTA agreement is predicted to be as big as 1.3 billion people living throughout Africa. Up to 30 million Africans, primarily

Nigerians, could benefit from this, breaking the cycle of terrible poverty (AFCTA Report, 2020).

Nigeria's economy could benefit from the African continental free trade area in the following ways:

**Increased Economic Growth:** According to the AFCTA Report (2020), the AFCTA might increase Africa's GDP by \$3.4 trillion, allowing up to 30 million Africans to escape extreme poverty. By doing this, Nigeria will become competitive in the global market because it will aid in the economy's quick industrialisation.

**Dynamic Business Environment:** In the absence of free trade agreements, nations frequently defended their own industries and firms. On the global market, the protection frequently causes them to stagnate and become uncompetitive. When the protection is taken away, they are inspired to rise to the level of genuine global rivals. AFCTA would benefit the Free Trade Area, and Nigeria is one of the nations where its business climate will improve. Nigerian companies can travel freely and conduct business in other African nations without incident.

**Lesser government expenditures:** Many governments support regional businesses. These monies can be used more effectively once subsidies are eliminated by the trade agreement. Nigeria stands to gain from this due to the excessively high operating costs that are suffocating the government's coffers.

**Foreign Direct Investment:** AFCTA is one agreement that is good for Nigeria both now and in the future. This is so that the AFCTA can draw many international investors to the nation. This increases funding for local industry growth and domestic business growth.

**Knowledge:** The AFCTA will draw several multinational firms to Nigeria. These international firms are better qualified than Nigerian firms to develop local resources. This is especially true in Nigeria's manufacturing, oil production, and mining industries. International corporations have

access to these business prospects thanks to free trade agreements. When international corporations work with regional businesses to build the resources, they educate them on best practices. This allows nearby businesses access to these novel techniques.

**Transfer of technology:** Local businesses access cutting-edge technology from their international partners. Jobs are more plentiful as local economies expand. International businesses train local staff on the job.

**Single Market Development:** The primary goal is to develop a single market for products and services to boost trade between African countries. **Expected Economic Boost and Trade Diversity:** UNECA predicts that once import duties and non-tariff barriers are eliminated, the AfCFTA will increase intra-African trade by 52.3%. The AfCFTA will cover a market with a GDP of \$2.5 trillion. The trade effort will also broaden the scope of intra-African commerce by promoting industrial commodities rather than extractive ones and natural resources. Historically, extractive commodities comprised more than 75% of African exports to countries outside the continent, while only 40% of trade within Africa involved them (AfCFTA Report, 2020).

**Collaboration and Enforcement:** The AfCFTA institutions make all decisions by a simple majority vote. There are numerous significant AfCFTA institutions. The AU Assembly supervises, directs, and interprets the agreement. State parties appoint and report to the Assembly through the Council of Ministers. The Council decides matters relating to the agreement. The AfCFTA's provisions are developed under the supervision of the Committee of Senior Trade Officials, which also executes Council decisions. The Secretariat is an independent institution, with the Council defining its duties.

**Removal of Tariffs:** State Parties shall gradually remove import taxes and grant preferential

treatment to imports from other State Parties. State Parties shall retain and further develop any preferential tariffs that are already in effect under any Regional Trade Agreements to which State Parties are Parties.

**Resolving Trade Disputes:** In multilateral trading systems, disputes can arise when one state implements a trade policy that another state party deems to violate the agreement. For certain situations, the Dispute Settlement Mechanism of the AfCFTA provides mediated discussions between conflicting parties. Private businesses cannot use the system; only state parties may (AfCFTA Report, 2020).

**Protecting Women Traders:** According to the African Trade Policy Centre and the UNECA, women are thought to make up about 70% of informal cross-border traders. Women who engage in informal trading may become targets of harassment and violence. With lower tariffs, it will be cheaper for women to conduct business through authorised channels, avoiding the need for them to expose themselves to risk.

**Development of Small and Medium-Sized Businesses:** Small firms now have access to trading opportunities in local marketplaces thanks to removing import taxes. 80% of the region's businesses are small and medium-sized enterprises. The ability of small business items to be traded as inputs for more prominent businesses in the area is also made possible by increased commerce.

**Manufacturing and Industrialization:** The AfCFTA promotes competitive manufacturing while also promoting industrialisation. Africa's manufacturing sector may grow from \$500 billion in 2015 to \$1 trillion in 2025 with the successful implementation of this new trade plan, adding 14 million steady jobs (AfCFTA Report, 2020).

**Sustainable Growth:** The AfCFTA supports a number of the targets in the 2030 Agenda for

Sustainable Development of the United Nations. For instance, Goal 8 of the Agenda calls for suitable employment and economic expansion, whereas Goal 9 calls for the encouragement of industry. As it lessens the continent's dependency on outside resources and promotes independent finance and development, the AfCFTA project thus helps achieve Goal 17 of the Agenda (AfCFTA Report, 2020).

### 3.0 CHALLENGES OF AFRICAN CONTINENTAL FREE TRADE ZONE IN RELATION TO THE NIGERIAN ECONOMY

If not handled properly, the difficulties that the various RECs have overcome can be exacerbated on the broader AfCFTA. These concern potential polarization, foreign party agreements, fiscal issues, institutional flaws, political stability and corruption.

**Economic polarisation:** The 54 member countries may provide member states with increasing market share and the creation of new markets. The more developed economies of South Africa, Nigeria, Kenya, and Egypt are significantly better able to market their exports due to the asymmetric product complementarity in the areas. Due to potential investment attraction towards these economies, this also raises concerns about potential polarization. This might severely harm the projected unification endeavour (AfCFTA Report, 2020).

**Contract negotiations with outside parties:** The anticipated FTA faces obstacles from the forces of the four blocs' external economic partners. The RECs' stance when working with outside partners will be weakened by a lack of shared policy among them.

**Fiscal issues:** The fact that most of the four REC nations, except for South Africa and Egypt, rely on trade tariffs for their fiscal funding will be a significant barrier to tariff liberalisation. For instance, trade taxes represent more than 50% of

the overall fiscal income in nations like Lesotho, Namibia, and Swaziland.

A shrinkage of previously import-substituting industries that were significant sources of income could result from the proposed trade agreement changing the structure of particular economies (notwithstanding the fact that most of their imports, on average, come from outside the regions). This has not, however, been used as a justification to put off starting the program. It will be essential to take care to increase the adequate tax base, look for alternative sources of funding, and, if available, emphasis greater budget control.

**Lack of harmonisation of institutions:** The current configurations' wind-up will be a significant obstacle for the new structure. These are organisations with legal status that member nations have mandated to carry out specific tasks. In the MOU that the Summit has mandated be created, the modus operandi is anticipated to be spelt out.

**Lack political will and stability:** Additionally, political will is required because, despite rhetorical claims of continental unification, there has not been any concrete action. Given the diversity of the participating economies and the fact that economic integration takes time, some have raised worry that the planned roadmap for regional integration may be overly ambitious. Others have issued a warning, urging prudence to guarantee that cross-border deregulation genuinely has the desired effects. It should be underlined that the anticipated outcomes are possible with the full implementation of the commitments to eliminate tariffs and if they are complemented by actions to reduce other trade obstacles in the region. Political unrest in certain important member nations, including Sudan and the DRC, makes the region dangerous for investment and undermines the advantages of the proposed FTA (AfCFTA Report, 2020).

**Corruption:** Another problem that plagues

Nigeria and all of Africa is corruption. So, to promote the continent's growth, Africa and Nigeria in particular should make a concerted effort to eradicate corruption.

#### 4.0 CONCLUSION/RECOMMENDATIONS

A new trade agreement establishing the African Continental Free Trade Area was signed at a summit of AU leaders in Rwanda on March 21, 2018 (AfCFTA). The AfCFTA's formal launch is a significant step toward eventual continental unification, regional integration, and closer economic connections. There are still concerns about whether African leaders will be able to implement the free trade area successfully, particularly in light of the fact that most continental and regional efforts to promote deeper intra-African trade have so far been hampered by a lack of political will, a lack of technical expertise among relevant stakeholders, and financial constraints.

What part will Africa be expected to play in any initiatives to change the capitalist systems obstructing the continent's prospects? The growth rates of Africa's constituent nations vary, despite the continent's overall positive long-term prospects. Even with these promises, Africa remains outside the global economy with no clear indication of immediate capitalist progress.

Population growth has outpaced production growth, the likelihood of considerably improving per capita output is declining rather than increasing, the infrastructure is getting worse, and the market for high value-added commodities is relatively small. Africa is becoming less and less of a destination for global money in pursuit of fresh investment opportunities. This is not to say that nothing is occurring, let alone that there are no other options. We will bring out the recommendations listed below based on the preceding conclusions:

I. African nations in general, and Nigeria in particular, should diversify their economies to bring about a paradigm shift from rural to urban

economies and the development of numerous sectors that will aid in the growth and development of Africa.

ii. Exports need to grow in order to finance investment. Building the infrastructure of a modern economy in emerging economies requires significant investments. For importing capital goods, which make up around half of all investment in Africa, exports are the primary way to make hard cash.

However, exports are necessary to fund the investments needed for diversification. This is not to argue that African nations must adopt the Asian

model of export-led prosperity and trade surpluses.

iii. Nigeria's leadership recruitment procedure needs to be cleaned up to produce strong leaders who can promote national growth. Therefore, African leaders, especially Nigerian leaders, should be dedicated, patriotic, and nationalistic in how they approach development in their nations. An export-focused, vibrant economy would result from this.

iv. Another problem that plagues Nigeria and all of Africa is corruption. So, to promote the continent's growth, Africa should make a concerted effort to eradicate corruption.

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## Construction of Monetary Services Index for Nigeria



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### Abstract

*The current monetary aggregates in Nigeria, namely M1, M2, and M3, are derived by simply summing up their components based on the assumption that they are basically the same. The simple sum approach has been criticised by several researchers as it is prone to aggregation bias. This study therefore, constructs a new set of monetary services index for Nigeria, namely MSI1, MSI2, and MSI3, using the Tornqvist-Theil Divisia monetary quantity index and data from the Central Bank of Nigeria ranging from 2007M12 to 2022M5. Consequently, it is recommended that monetary service indices be used in addition to traditional simple sum monetary aggregates for policy decisions in Nigeria as practiced in other jurisdictions and given the relevance attached to it by the IMF-Monetary and Financial Statistics Manual and Compilation Guide 2019. The adoption of the MSIs to complement the simple sum will enhance the credibility of the monetary policy committee's decisions because the MSIs will act as a further validation of the simple sum aggregates.*

**Key Words:** *Divisia index, Divisia monetary aggregates, Simple sum monetary aggregates*

### 1.0 Introduction

The monetary stock is critical in every contemporary economy, and it has been at the forefront of most countries' monetary policy planning. Consequently, scholars and policymakers have shown increasing interest in measuring the stock of money (Anderson et. al., 2011). Central banks and economists simply measure different levels of monetary aggregates (M1, M2, M3,...) by summing up the quantities of the components of monetary assets. Given today's financial market developments and instrument innovations, whereby monetary assets possess different degrees of liquidity and yielding varying interest rates, simple sum measures are misleading and can harm inferences about economic condition and the economy (Barnett and Nguyen 2021).

It is argued that these traditional aggregates suffer from aggregation bias and thus, do not adequately account for financial sector trends (Barnett and Alkhareif, 2015). This aggregation method treats all monetary components as having the same degree of "moneyness" in them. Currency, demand deposits, savings, and time deposits are given equal weights rather than unequal weights to represent the utility of each monetary component in the flow of transactions or monetary services (Barnett, 1980). Simple sum monetary aggregates have been criticised for providing perfect substitutability among various monetary components.

Money aggregates are frequently used by central banks as an indication of near-term economic factors, such as future expenditure or inflation, to help them make monetary policy decisions. Compilers are motivated to get closer to the optimal underlying measure of system-wide liquidity for this reason. Furthermore, due to the ambiguous relationship between money supply and macroeconomic indicators, there has lately been extensive research and debate among policymakers on the right measure of monetary

aggregates for Nigeria (Doguwa et. al., 2014; Hussin and El-Rasheed, 2019; Idris, 2019). Empirical research have demonstrated that certain monetary aggregate definitions reflect changes in macroeconomic variables better than others, necessitating the need to develop the right definition of money for each economy on a regular basis as they change (IMF-MFSMCG 2016). Many attempts have been made over the years to correctly weigh the monetary components in a simple-sum aggregate, but any weighting technique without a theory is suspect (Serletis and Xu, 2020).

Given the aggregation bias of the simple sum measure, different aggregation processes, such as variable elasticity of substitution (VES) and monetary service index(also known as Divisia monetary aggregation), have gained attention as a compliment to the simple sum aggregation. The invention of "Divisia monetary aggregates" by William Barnett, which assess the flow of "monetary services" received from owning a portfolio of monetary assets, was a significant breakthrough in monetary economics (Anderson et. al., 2019).

Several studies have supported and demonstrated the relative benefits of the monetary services index (MSI) over the comparable simple sum in the choice of aggregation processes (Gebregiorgis and Handa, 2004; Barnett 1980, 2016; Barnett et. al., 1984; and Belongia 1996). However, Khainga (2014) thought that the MSI and simple sum performed equally well and should be used as compliment. Weights that represent the flow of monetary services are assigned to monetary sub-components in a Divisia monetary aggregate measure of money (Barnett 1980). Divisia's monetary services do not allow for replacement among the components of money supply. Simple sum monetary aggregates, on the other hand, consider all sub-components of money to be perfect replacements for one another in terms of moneyness.

The component variables, which include currency outside depository corporations, transferable deposits, savings, time, and foreign currency deposits as well as, CBN bills held by the money holding sectors, are given equal weights rather than unequal weights that indicate their importance or usefulness in conducting transactions. The classic simple-sum monetary aggregates, which assume perfect replacement among the components of money supply, are blamed in the "Barnett critique" for money's failure to describe real activities. Given the rising quantity of financial assets with variable degrees of "moneyness," an alternate measure of money supply is required.

As a result, the Divisia monetary aggregates were developed as a feasible alternative, assigning different weights to the various component assets. Many theoretical and empirical research have shown that Divisia monetary aggregates outperformed their simple sum equivalents, which lack sound economic theoretical foundations (Barnett and Nguyen, 2021).

The works of Gebregiorgis and Handa (2004) and El-Rasheed and Abdallah (2017) were the only known research on Divisia monetary aggregates construction for Nigeria. The earlier paper used Index of Industrial Production due to the lack of data on real GDP and also utilised currency, demand, and savings deposits as financial instruments which were the only components of broad money supply at the time. Furthermore, despite certain parallels in the variables and methods used by the study of El-Rasheed and Abdallah (2017) and ours included the broadest definition of money supply in Nigeria (M3) to capture instruments innovation and changes in the Nigerian financial system. As a result, this paper constructs monetary service index using the Divisia approach to monetary aggregation. After the introduction, the remainder of the article is organised as follows: The literature review is presented in section 2, the methodology is discussed in section 3, the results and discussion are presented in section 4, the conclusion is in section 5 and policy recommendations in section 6.



## 2.0 Theoretical and Empirical Literature

### 2.1 Theoretical Literature

Barnett (1980) advocated for a link between monetary microeconomics and statistical index number theory. He argued that monetary assets are interest-yielding assets in modern economics, and that employing simple sum aggregation does not have a good theoretical basis in economics or statistics. In other words, various monetary assets have varied attributes and characteristics in terms of the benefit derived by holding them. Moreover, targeting the simple sum is proving to be very narrow for the objective of monetary policy as financial developments resulted in a variety of instruments innovation capable of impacting aggregate spending. To build asset approximations, this unique approach utilised neoclassical monetary theory's aggregator functions and the statistical theory of index numbers. Therefore, the aggregated data and models derived from it are compatible with both the theory that created the data and the theory that was used to developed the models that the data was utilised for.

As a result, the MSI is based on demand theory and statistical index aggregation theory. This method considers monetary assets as demand functions. The reason is that their utility function defines the utility obtained and consequently their marginal utility, monetary assets are implicitly referred to be consumer products. To compute a Divisia monetary index, two key assumptions are made. Firstly, that relatively illiquid components of M3 such as CBN bills held by the money holding sectors are less likely to be used for transaction purposes than liquid measures such as currency notes and coins. Secondly, that higher interest rates are paid on less liquid components. In other words, it is assumed that the higher the relative return on an asset, the less useful it is for transaction purposes.

The proportionate utility of each asset is proxied in the Divisia index by its flow of marginal utility, which is the difference between the item's value

and its "service flow" to the user. As a result, at an equilibrium, the service flow equals the asset's marginal utility. The user costs of the components of monetary assets can be used to estimate the marginal utility of the assets in terms of monetary assets. This might be read as the percentage of interest income or other income generated from holding the monetary assets as opposed to holding other assets as a store of value. The degree of liquidity is used to classify monetary assets. Highly liquid assets (cash or money) have a high user cost, which is defined as the interest or return per asset over time. As a result, the Divisia index gives this asset class higher weights. Other assets with no user cost and are purely utilised for storing value are given a weight of zero. As a result, the goal of a Divisia monetary index is to create an index that measures the flow of monetary services from a collection of monetary assets, where the utility derived or user cost derived per asset value in a monetary asset varies per unit cost of monetary measure from one asset to the next. The main problem is determining the flow of values of the user cost, not determining the weights or constructing the index (Thornton and Yue 1992).

A simple sum monetary aggregation, according to Anderson et. al., (1997), is only compatible with microeconomic theory when economic decision makers own just one monetary asset. This assumption concerning monetary asset substitutability may prove to be illogical. The Divisia index, on the other hand, does not make such a strong assumption about replacement elasticities and instead categorises monetary assets according to their discounted spread, or user costs.

The user cost of a monetary asset is the discounted interest foregone by the household because of choosing to keep the item (Anderson et. al., 1997). It shows the discounted spread between a benchmark asset's rate of return and a specific monetary asset's rate of return. "A risk-free asset that can only be used for inter-temporal wealth transfer and offers no extra services" is how the benchmark asset is defined (Anderson et. al., 1997).

## 2.2 Empirical Literature

Several studies have attempted to give empirical support for the use of different measures of system-wide liquidity to inform policy actions to guarantee price stability. This section discusses some of these studies.

Darvas (2014) used structural vector-autoregression (SVAR) model with monthly data from 2001: M1 to 2014: M9 to investigate the potential impact of money shocks on output and prices in the eurozone. The study found that Divisia aggregates had a considerable influence on prices, interest rates, and production 18 months after the shock. Furthermore, the eurozone added to the evidence from US data that Divisia monetary aggregates are useful in measuring the effects of monetary policy and perform better in SVAR models than simple-sum measures of money. Belongia and Ireland (2017) used quarterly data from 1967: Q1 to 2017: Q2 to examine demand for Divisia money in the United States. They evaluated the money demand equations using Johansen's (1991) maximum likelihood technique, and the findings demonstrated that information in the Divisia monetary aggregates can assist to identify monetary policy stance as well as the effect of monetary policy on output and inflation.

Celik and Uzun (2009) used panel cointegration to compare simple sum and Divisia monetary aggregates for the United States, United Kingdom, Eurozone, and Japan between 1980Q1 and 1993Q3.

Their findings showed that there was a rather robust long-run link between Divisia monetary aggregates and income as well as interest rates when compared to simple-sum monetary aggregates. Barnett and Su (2015) used diagnostic tests of bivariate time series features of Divisia M2 and nominal GDP stochastic processes to test Belongia & Ireland (2017) and Barnett et. al., (2016) suggestions on Divisia monetary aggregates as an intermediate target with nominal GDP as the final target. There was no evidence to dispute the potential importance of Divisia

monetary aggregates in influencing nominal GDP, either as an intermediate objective or as an indicator, according to the findings. Stracca (2004) examined the Divisia monetary aggregate in the eurozone using extensive data from 1980 to 2000, assessing demand for Divisia monetary aggregate. According to the findings, the Divisia monetary aggregate provided more similar quality information in the future than the simple sum of M1 and M3. Furthermore, it demonstrated that money and liquidity should be given a significant role in determining monetary policy in the eurozone.

Reimers (2002) investigated several Divisia monetary aggregates for the eurozone from 1980 to 2000. The analyses were conducted using three methods: the cointegrated vector error correction (VEC) model and single-equation techniques; the aggregates' information content in terms of future output was investigated; and the P-star framework was used to determine the importance of money for future price movements. Divisia aggregates were shown to be crucial for HICP development and GDP deflator movement. Uzun (2010) used two testing approaches to investigate the superiority of Divisia monetary aggregation over the simple sum method. The system estimated (Seemingly Unrelated Regression) for the United States, the United Kingdom, the Eurozone, and Japan from 1980Q1 to 1993Q3 utilising time series and panel data studies. The study's findings demonstrated a long-run relationship between Divisia monetary aggregates and income (as defined by real GDP) as well as interest rates when compared to simple sum monetary aggregates.

Using wavelet analysis, Scharnagl and Mandker (2015) examined the link between the simple sum and Divisia monetary aggregates with real GDP and inflation. The study, which spanned the years 1967 to 2013, was based on data from the United States. The association between money growth and inflation was shown to be greater when Divisia monetary aggregates were used compared to simple sum aggregates. Gogas et. al., (2013)

assessed the forecasting capacities of simple sum and Divisia Monetary Aggregates with reference to US GDP from 2008Q1 to 2011Q4 using a Support Vector Regression (SVR) model equipped with the Linear and Radial basis function kernels. The analysis used two different Divisia aggregates: one created by the Center for Financial Stability (CFS Divisia) and one developed by the Federal Reserve Bank of St. Louis (MSI Divisia). In terms of conventional forecast assessment statistics, the Divisia monetary aggregates outperformed the basic sum monetary aggregates.

Others, such as Ghosh and Bhadury (2018), used the bootstrap Granger causality method of monthly data for India (1994: M4 to 2008: M6), Israel (1994: M1 to 2011: M11), Poland (2001: M1 to 2015: M6), the United Kingdom (1999: M1 to 2013: M12), and the United States (1994: M1 to 2017: M2) to investigate the undetermined influence of Divisia monetary aggregates in explaining exchange rate variations for the countries in the study. The results of the complete sample bootstrap approach revealed that Divisia monetary aggregates had a considerable influence on exchange rates in Israel, Poland, the United Kingdom, and the United States. Furthermore, Divisia had a substantial impact on India's actual effective exchange rate.

Acharya and Kamaiah (2001) used money demand stability, information content, and Davidson-Mackinnon J-tests to undertake an empirical review of simple sum and Divisia monetary aggregates in India across two sample periods (1970-1996 and 1985M4-1994M9). The findings demonstrated that Divisia aggregates outperform their simple sum counterparts, corroborating previous research findings. Alkhareif and Barnett (2012) examined Divisia monetary aggregates for Gulf nations from 2004: M6 to 2011: M12. The research examined the dynamics of several factors, including dual price aggregates, aggregate interest rates, and Divisia aggregate user cost growth rates.

The results showed the superiority of the Divisia indices over simple-sum monetary aggregates in

monitoring the business cycles of the economies and provided direct evidence of greater economic harmonisation among Gulf countries, particularly in terms of their financial markets and monetary policy. Polat (2018) conducted a similar assessment for the Turkish economy from 2006 to 2016 using SVAR.

When compared to their simple sum equivalent, the findings revealed the robustness of Divisia aggregates in predicting quantity and price variables. While the relative efficacy of the Divisia aggregates in forecasting quantity and price variables was present under various specifications, it might be claimed that the theoretically well-rounded formulation of the Divisia index was not experimentally supported in the instance of Turkey.

Leong et al., (2010) used the Augmented Dickey-Fuller test and Johansen's Maximum-Likelihood technique to analyse the efficacy of Malaysian monetary policy using different monetary aggregates of quarterly data from 1981:Q1 to 2004:Q4. The results showed that Divisia M2 is stable in the money demand function. Tariq and Matthews (1997) utilised a cointegration technique to compare the demand for simple sum M1 and M2 with Divisia estimates for Pakistan from 1974: Q4 to 1992: Q4. Although both measures exhibited a steady demand for money and performed well in post-sample stability testing, the results showed that the Divisia measure performed somewhat better on traditional statistical criteria.

El-Rasheed (2018) used the ARDL and Toda Yamamoto causality methodologies to analyze Divisia monetary aggregates, demand for money stability, income, and inflation changes in four Sub-Saharan African (SSA) nations, namely Kenya, Malawi, Nigeria, and South Africa, from 2000Q1 to 2015Q3. The findings reveal that Divisia monetary aggregates explain the stability of money demand functions effectively and that there is a considerable two-way correlation between money and income. Furthermore, Khainga (2014) discovered that the constructed Divisia indices

outperform traditional measures in a similar study on Divisia monetary aggregates and demand for money in Kenya from 1995Q4 to 2011Q3, employing the ARDL technique. However, Ndjokou(2021) found that traditional monetary aggregates outperformed Divisia in terms of income and inflation from 1992Q1 to 2009Q4 in BEAC and BCEAO, using VAR/VECM.

Gebregiorgis and Handa (2004) used Johansen cointegration and error-correction modeling approaches to analyse monetary aggregation for Nigeria from 1970: M1 to 2000: M4 using currency, demand deposits, and savings deposits of simple sum, VES, and Divisia aggregates. The results indicated that currency explained industrial production better than narrow or broad money measures, while the simple sum of M1 and M2 outperformed both the VES and Divisia aggregates in Nigeria.

In a more recent study for Nigeria, El-Rasheed and Abdallah (2017) used the ARDL technique to investigate Divisia monetary aggregates and demand for money from 2000Q1 to 2015Q4. Their result indicated that Divisia aggregates perform better in explaining fluctuations in money stock and established a long-run co-integration between Divisia monetary aggregates and income, inflation, interest, as well as exchange rates.

In the conduct of its monetary policy, the Central Bank of Nigeria has relied heavily on monetary aggregate targeting. Furthermore, over the last two decades, Nigeria's financial sector has transformed both in terms of reforms and instrument developments, which may have influenced monetary aggregates but not fully accounted for by the simple sum aggregates. Gebregiorgis and Handa (2004) and El-Rasheed and Abdallah (2017) have attempted to construct Divisia aggregates for Nigeria, however, they were constrained by the choice of an appropriate benchmark rate. This study builds on their works by incorporating securities other than shares (held by the money holding sectors) which is a recent instrument introduced in Nigeria's definition of broad money aggregate to construct the Monetary Service Index.

### 3.0 Data and Methodology

#### 3.1 Data

To construct monetary services index using Divisia approach, we need data on both nominal values and the rate of return on each monetary asset, Barnett (1978, 1980). Table 1 provides a basic description of the data set used in the study.

The data and rates of return on monetary assets were sourced from the CBN Statistics database starting from end-December 2007 to end-April 2022. The cost of living index is proxied by the consumer price index (CPI), obtained from the National Bureau of Statistics.

**Table 1: List of Variables for Monetary Services Index Construction**

S/N	Monetary Assets	Rate of Return
1	Currency Outside Depository Corporations	0%
2	Transferable Deposits	Demand Deposit Rate
3	Time Deposits	3-month deposit rate
4	Savings Deposits	Savings Rate
5	Foreign Currency Deposits	3-month LIBOR <sup>1</sup>
6	CBN Bills held by Money Holding Sectors	OMO Bills rate

Table 2 is the clustering and nesting of the components of monetary assets as it was captured in Barnett and Nguyen (2021) for ease of understanding. Therefore, Divisia aggregate M1 (DM1) constitute the same components with simple sum aggregate, SM1. Divisia M2 (DM2) aggregate comprises of DM1 components and savings, time, and foreign currency deposits. Lastly, Divisia M3 aggregate (DM3) consist of the components of DM2 and CBN bills held by money holding sectors.

Table 2: Nesting of Components of the simple sum and Divisia Aggregates

S/N	Monetary Assets	SM1	SM2	SM3	MSI 1	MSI 2	MSI 3
1	Currency Outside Depository Corporations	1	1	1	1	1	1
2	Transferable Deposits	1	1	1	1	1	1
3	Time Deposits	0	1	1	0	1	1
4	Savings Deposits	0	1	1	0	1	1
5	Foreign Currency Deposits	0	1	1	0	1	1
6	CBN Bills held by Money Holding Sectors	0	0	1	0	0	1

Note: In Table 2, 1 (0) means the presence (absence) of the component in the aggregate considered.

### 3.2 Simple Sum Monetary Aggregates

Monetary authorities across different jurisdictions carry out classification of monetary aggregates for easier identification using prefixes M0, M1, M2, and M3, depending on the depth of the financial system and level of the liquidity of the instruments defining the monetary aggregates. The current definition of broad money supply in Nigeria, is based on functional approach to monetary aggregate compilation following the framework of MFSMCG 2000 & 2016 using the traditional approach of summing together the different components into a single aggregate without weighting the components. Also, given M as monetary assets, the simple sum monetary aggregate is specified as:

$$M = \sum_{i=1}^k m_i \tag{1}$$

where M stands for the nominal monetary aggregate;  $m_i$  stands for nominal value of the  $i^{th}$  monetary item and  $i = 1, 2, \dots, k$ . This measure treats the components ( $m_i$ s) as perfect substitutes (IMF-MFSMCG, 2016).

Following the inclusion of a new monetary instrument in the Nigerian definition of broad money, namely debt instruments issued by the Central Bank and held by the private sector, M3 is the additional broad definition of money supply, aside M2. Consequently, M3 is the intermediate target in Nigeria's monetary policy framework. The following are the detailed definitions of the monetary aggregates compiled in Nigeria:

- a) M1 encompasses currency outside

depository corporations and public non-financial corporations' transferable deposits at the CBN as well as private sector transferable deposits at the ODCs. Thus, M1 is denoted as:

$$M1_t = CoDC_t + TD_t \tag{2}$$

where CoDC stands for currency outside depository corporations, TD stands for public non-financial corporations (PNFCs) transferable deposits at the CBN, and ODCs private sector transferable deposits.

Note that:

$$CoDC_t = CIC_t - VC_t \tag{3}$$

where, CIC stands for currency in circulation, while VC stands for ODCs' vault cash.

- a) Narrow money (M1) and other deposits (savings, time/term, and foreign currency deposits of resident sectors with ODCs) are included in the definition of the money supply (M2). Clearly, M2 considers not only those financial assets which can be used directly as medium of exchange but also as close substitutes. Central or Federal Government and non-residents transferable and other deposits at ODCs are not included as components of money supply. These deposits are generally excluded because they do not respond to movements in macroeconomic variables such as changes in national income, interest rate, exchange rate, among others, to the same degree as those of the money holding sectors (IMF-MFSMCG 2016). Furthermore, analytical approach to monetary and fiscal policy formulation also supports this exclusion to enable net analysis of central government financial position. As for the non-

residents, they hold significant portion of their deposits to facilitate foreign transactions rather than domestic spending.

$$M2_t = M1_t + OD_t \quad (4)$$

where,

M1 is narrow money supply and OD is other deposits.

- a) Nigeria's broad money definition, M3 includes money supply (M2) and securities other than shares held by the money holding sectors and denoted from the user side as follows:

$$M3_t = M2_t + SOS_t \quad (5)$$

where, M2 is money supply, SOS is securities other than shares held by the money-holding sectors.

Correspondingly, M3 specification from the source side is written as:

$$M3_t = NFA_t + NDC_t - OIN_t \quad (6)$$

where NFA denotes net foreign assets, NDC is net domestic credit, and OIN denotes other items net.

This method of aggregation simply assumes perfect substitutability of monetary assets included. However, monetary assets included are not close substitutes of assets excluded. It is not always obvious that the assets a priori designated as components of broad money liabilities are perfect substitutes (Gebregiorgis and Handa, 2004).

### 3.3 Divisia Monetary Aggregates

The Divisia index was developed by Divisia (1925) as a continuous timeline integral for perishable consumption goods. The growth rate of the Divisia index is a weighted average of component growth rates. The weights in the aggregate growth rate are the expenditure shares of the components with user cost pricing at any given point in time. The index level, on the other hand, is not a weighted average of the component values. The level is a nonlinear line integral with strong nonlinearity. The Divisia index is derived directly from the optimisation of customer behavior. There is no error in approximation. Economic data, on the other hand, is not available in real time. To

discretise the continuous time Divisia index, the share weights must be measured somewhere during the discrete time period. Tornqvist (1936) argued for using the average of the share at the beginning and conclusion of the discrete time period. Because the average share price fluctuates over time, the resulting index is chained rather than fixed base. Another proponent of discretisation was Theil (1967). Based on Tornqvist and Theil's research, the resulting index is known as the Tornqvist–Theil Divisia index or the Tornqvist–Theil index.

The Divisia approach to monetary aggregation is based on the theoretical underpinnings of statistical index numbers. It is a quantity index that quantifies the change in money quantity from one period to the next by assigning varying weights to the growth rates of the components of money (currency, transferrable and other deposits, among others) based on their usefulness for transaction purposes (IMF-MFSMCG, 2016). Divisia aggregates are based on user-cost (opportunity cost), which is a proxy for expressing the relative relevance of the distinct components in the transaction process. The spread between a benchmark rate (the interest rate paid on a financial instrument that cannot be used to make transactions in the short-run) and the rate paid on a specific component of the monetary aggregate yields the nominal user-cost.

The Divisia aggregate considers the trade-off between the medium of exchange and store of value functions of money components. According to the postulation, somewhat illiquid financial assets are less likely to be used for transaction purposes than highly liquid assets included in the national definition of money supply, and higher interest rates are paid on the less liquid assets (IMF-MFSMCG, 2016). National currencies and non-interest-bearing transferrable deposits have the highest weights since they are most commonly used as a medium of exchange, while those that are not utilised as a medium of exchange have the lowest weight.

Let  $M_{it}$  be the quantity of the  $i$ th nominal monetary asset and  $S_{it}$  be its relative share of the monetary aggregate's expenditure on services in period  $t$ . The Tornqvist-Theil Divisia monetary quantity aggregate/index (DMA) is defined by Anderson et. al., (1997) as follows:

$$DMA_t = DMA_{t-1} \prod_{i=0}^n \left( \frac{M_{it}}{M_{it-1}} \right)^{0.5(S_{it} + S_{it-1})} \tag{7}$$

where  $DMA_t$  is the Divisia index,  $DMA_{t-1}$  is the lag of the Divisia index,  $S_{it}$  is the spending share of the monetary assets  $i$  at time  $t$ ,  $S_{it-1}$  is the lag of the expenditure share of the monetary assets  $i$  at time  $t$ , and  $M_{it}$  is the monetary assets  $i$  at time  $t$ . By using the logarithm and other transformations, we may calculate the percentage change of eq. (7) as follows:

$$\Delta \log DMA_t = \sum_{i=1}^n \frac{1}{2} (S_{it} + S_{it-1}) \Delta \log M_{it} \tag{8}$$

Note that  $\Delta \log \Phi_t = \log \Phi_t - \log \Phi_{t-1}$ , ( $\Phi_t = DMA_t, M_{it}$ )

The weight  $S_{it}$  is based on the user cost of the components and on the relative amount outstanding of the different money components and is defined as:

$$S_{it} = \frac{M_{it} \pi_{it}}{\sum_{j=1}^n M_{jt} \pi_{jt}} \tag{9}$$

In eq. (9),  $\sum_{j=1}^n M_{jt} \pi_{jt}$  represent the entire expenditure on monetary assets and  $\pi_{jt}$  denotes the user cost of money for asset  $M_{jt}$  and their respective user costs,  $\pi_{jt}$ .

It is important to highlight that the user cost of a monetary asset  $i$  is a function of the difference between a benchmark rate and the asset's own rate of return  $r_{it}$ , discounted at the benchmark rate. The benchmark asset does not provide monetary services to the economic agent during the planning period, except at the end of the planning horizon; it merely serves as a store of value. It can also be considered as an asset that is primarily utilised to transfer wealth from one time to the next. The user cost of a monetary asset is also known as the opportunity cost or price of the monetary asset's transaction service and is denoted as:

$$\pi_{it} = P_t \left( \frac{R_t - r_{it}}{1 + R_t} \right) \tag{10}$$

where  $R_t$  is the benchmark rate at time  $t$ ,  $r_{it}$  is the holding period yield on monetary asset  $i$  at period  $t$  and  $P_t$  is the cost of living index or price index.

Since the benchmark return is typically expected to be the maximum available holding period rate for a specific class of monetary assets at any moment in time (Barnett 1978 and Dahalan et. al., 2005), we defined it based on the monetary assets evaluated and their individual rates in Nigeria.

$P_t$  is thus defined as:

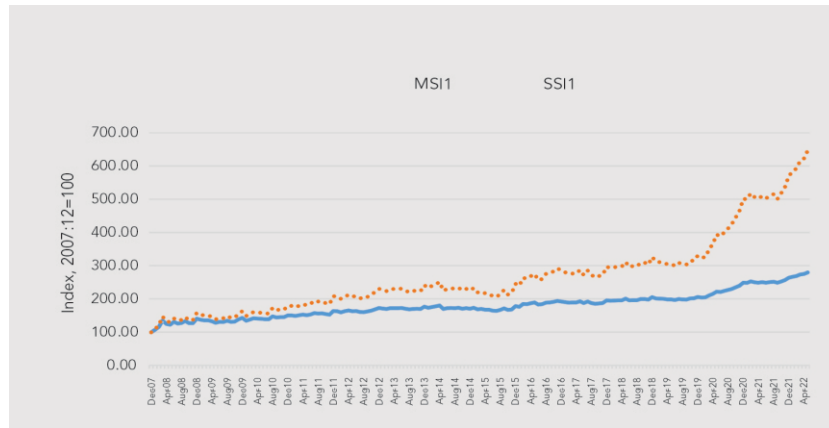
$$R_t = \text{Max}(D_{r_t}, S_{r_t}, T_{r_t}, FC_{r_t}, CB_{r_t}, TB_{r_t}) + K \tag{11}$$

where,  $D_{r_t}$  is the rate of interest on demand deposits,  $S_{r_t}$  is the interest on savings deposits is  $T_{r_t}$  the interest rate on time deposits,  $FC_{r_t}$  is the interest return on foreign currency deposits,  $CB_{r_t}$  is the interest yield on CBN bills,  $TB_{r_t}$  is the interest return on 91-day Nigerian treasury bills and lastly,  $K$  is a constant term with a value of 0.001. The constant term is conventionally determined to ensure that the interest rate earned on any monetary asset considered is not higher than the benchmark rate (Anderson et. al., 1997; Khainga, 2014; and Hussin and El-Rasheed, 2019). The study used equation (7) to construct Divisia monetary aggregates for Nigeria for the period 2007M12 to 2022M5.

#### 4. Results and Discussions

##### 4.1 An Appraisal of Simple Sum and Monetary Service Index

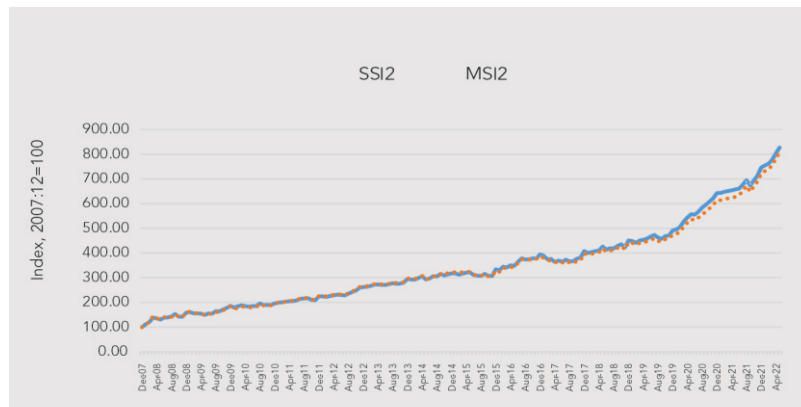
The simple sum aggregates were transformed to equal 100 at the beginning period, 2007:12 to allow comparison with the MSI. Figures 1–3 provide a graphical representation of the simple sum and MSI. Figure 3 shows a significant difference between the simple sum and MSI measurements. The difference could be explained by the simple sum aggregation, which assigns equal weights to the components of M1, namely cash outside depository corporations and transferable deposits, as opposed to the Divisia measure, which assigns different weights to the sub-components. This supports Khainga's (2014) argument that the degree of substitutability among M1's constituents appears to be lower than that of higher-ordered aggregates M2 and M3.



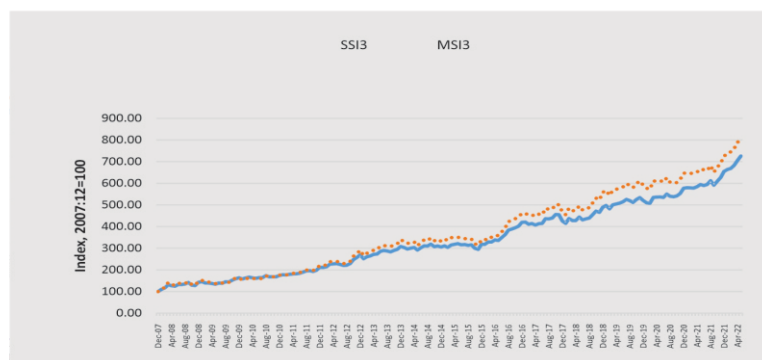
**Figure 1:** Simple Sum Index 1 and MS11.

Figures 2 and 3 appear to show that the degree of substitutability across M2 and M3 subcomponents is greater, as indicated by the lower fluctuation between the two monetary aggregates measures. In terms of moneyness, the higher the sequence of the monetary aggregates, the higher the level of

substitutability of their components. Although the difference between M3 and M2 measures of money supply is greater, it is possible that the additional component to M2 to obtain M3 is more of a store of value instrument rather than a medium of exchange.



**Figure 2:** SSI2 and MS12.



**Figure 3:** Simple Sum Index 3 and MS13.



The growth rates of the simple sum and Divisia monetary aggregates are depicted in Figures 4-6. An examination of the trends reveals that the two series are moving essentially identically, except for a shift from the beginning of 2009 onward. The significantly slower expansion of the aggregates after 2008 was due to restricted liquidity in the inter-bank segment of the financial markets because of portfolio investment outflows caused by the worldwide credit crunch during the 2007/08

Global Financial Crisis (GFC). To ensure financial system stability, the CBN used a number of monetary policy measures to assure appropriate liquidity in the banking sector (CBN Annual Report, 2008). The implementation of these policies resulted in a liquidity surplus in the system, which had to be cleaned up. Since then, the Bank has maintained a tight monetary policy stance with periodic easing, as evidenced by the plots.

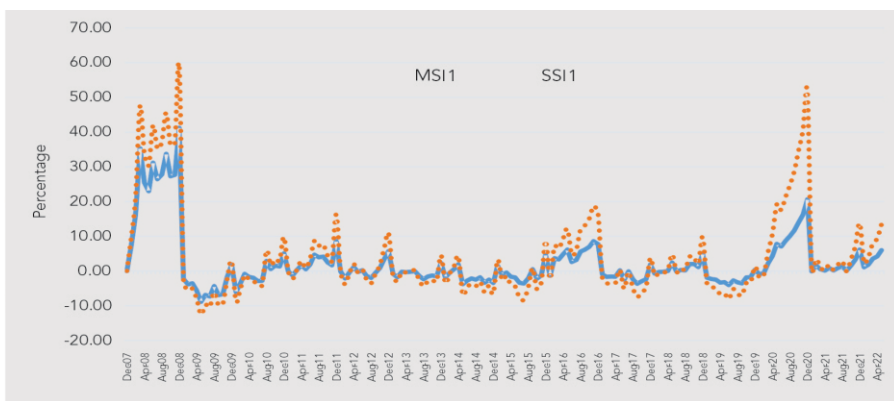


Figure 4: Growth Rates of SSI1 and MSI1.

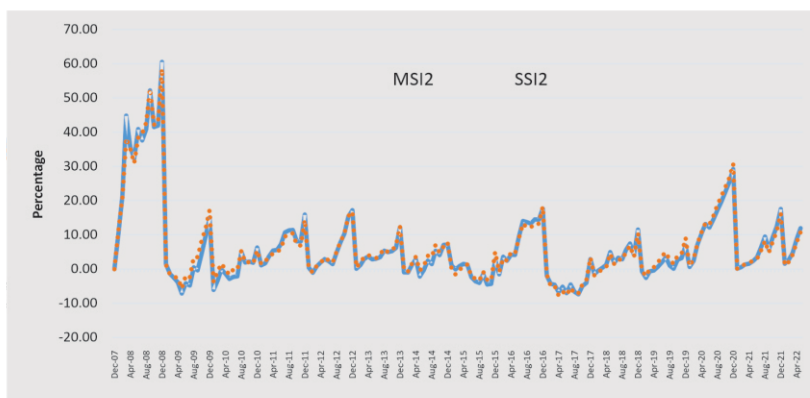


Figure 5: Growth Rates of SSI2 and MSI2.

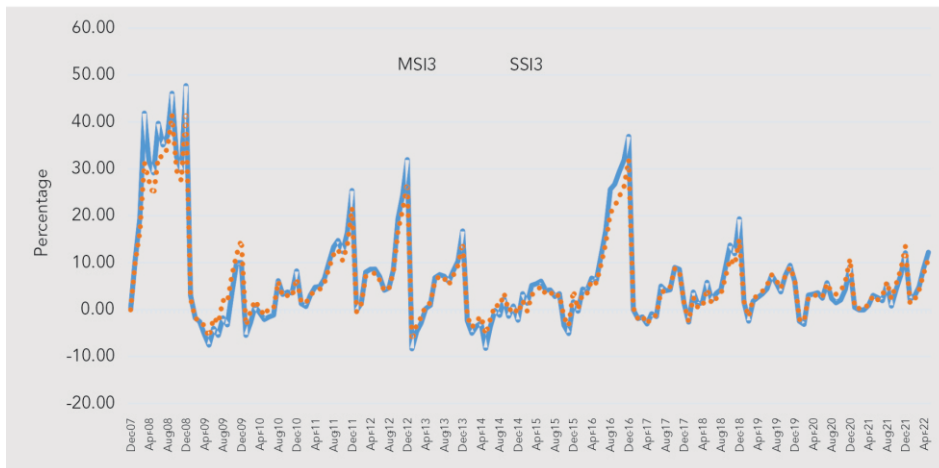


Figure 6: Growth Rates of SSI3 and MSI3.

## 5. Conclusion

The greater unpredictability of broad money aggregates' correlations with nominal income and inflation, as earlier discussed, has limited their use as intermediate targets or even as monetary indicators. It has frequently been difficult to explain why monetary aggregates behave as they do, and even more difficult to deduce what these changes indicate for the macroeconomic outlook. Divisia's design permits econometric models to be built on well-established theories of transaction demand for money. A Divisia measure of money has theoretical appeal as a measure of transaction services, weighting each type of monetary assets based on the transaction services provided by each. Such a metric may be more closely related to total economic expenditure than traditional monetary aggregates.

As discussed by Hancock, M. (2005) in the Quarterly Bulletin of Bank of England, there are both theoretical and practical obstacles in developing an index that evaluates the transaction services supplied by various types of monetary assets. However, it would be incorrect to argue

that a Divisia index would necessarily be inferior to traditional monetary aggregates. First, these theoretical and practical challenges may not be severe; second, some of these difficulties apply to conventional monetary aggregates at least equally. As a result, even if a Divisia index captures transaction services only partially, it may provide a better measure of money than other monetary aggregates.

## 6. Policy Recommendation

This article constructed a Monetary Service Index for Nigeria and appraised it alongside the Simple Sum Index supported by several literatures (El-Shagi and Kelly, 2019, Kelly et. al., 2014, Keating et. al., 2019 and Hancock, 2005). Thus, it is recommended that MSI should be produced and used for policy decisions alongside the traditional simple sum aggregates as practiced in other jurisdictions and discussed in IMF-MFSMCG 2016. The adoption of the MSIs to complement the simple sum will enhance the credibility of the monetary policy committee's decisions because the MSIs will act as a further validation of the simple sum aggregates.

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