**ABSTRACT**

The acceptance of digital currency transactions by many African countries seems to be relatively low to enhance a cashless economy spurs the need for this study. This study aims to identify the impact of digital currency operations and suggest Nigerians cashless policy management. The study tests the praxis of financial dualism for digital currency and monetary policy in the South African economy. The Market capitalization (Mcap) and Volume (Vol) of crypto-currency, and monetary policy rate (MPR) of fourth-month ending quarterly information were extracted from Central Bank Digital Currency and the South Africa Reserve Bank around April 2013 to December 2019. The Augmented Dickey-Fuller unit root and the Autoregressive Distributive Lag tests were conducted. The ADF unit root test results were not stationary at level but became stationary at the first level difference. Furthermore, the results of the ARDL indicated no positive and significant relationships between Market Capitalization and Volume of crypto-currency and monetary policy in the South African economy. However, positive and significant relationships exist in monetary policy in the South African economy. The study then concluded that (Mcap) and (Vol) of digital currency did not constitute the significant variables of policy to influence the monetary policies in the South African economy, hence they operate independently. The study then concluded that a decision to adopt and regulate digital currency operation or not in Nigeria does not affect. The study, therefore, recommends the Nigerian to embrace the digital environment in terms of regulations for tax advantage.

**Keywords:** Digital currency; monetary policy; South Africa; financial dualism and ARDL.

**1. INTRODUCTION**

A stable monetary policy in any nation can be seen as an economy approaching full employment which in turn promotes development in the world at large. The process or the combinations of policies to achieve a stable monetary economy has been on the front burner...
of the apex bank. In Nigeria, the Central Bank has the core mandate to maintain economic stability through monetary policies. Further, the federal ministry of finance is in charge of the responsibilities of maintaining a stable economy through fiscal policies. Both are complementary measures ensure to achieve a stable exchange rate, interest rate, inflation rate, and other macroeconomic indices. Financial dualism has emerged to also stimulate and stabilise the economy. This appearance put into the existence of the organised and unorganised monetary market, especially in less developed countries. Such transactions range from the traditional to the modern digital form. The organised monetary market in Nigeria, for instance, is properly regulated by the Central Bank of Nigeria, Securities and Exchange Commission, Nigeria Insurance Deposit Bank and the Federal Ministry of Finance. On the other hand, the unorganised is not regulated which digital currency remains one of the aspects of financial dualism. Meanwhile, its activities promote financial intermediation and affect the monetary policies either positive or negative.

Digital currency transactions aid the cashless economy and it is a growing financial intermediation environment in the world over. Digital currency market trades on crypto-currency like the Bitcoin and among others. This transaction has nothing to do with physical contact or cumbersome documentations. Understanding these facts of interest some sets of nations distance and placed a warning to its citizens to be cautious and deliberately ignored to regulate the digital market operations which make its acceptability relatively low. Such countries see these transactions as a Ponzi scheme or too volatile. Meanwhile, as a result of the expected returns and its relationship to the fiscal environment few countries in Africa like South Africa are trending the corridors of digital currency. This lofty ideal is yet to be accepted and regulated in the Nigerian economy. There seem deliberate acts of neglect of this digital currency environment which its primary function is to operate a cashless and to maintain a stable economy. Myint [1] discovered the coexistence of the traditional and modern sector economy to enhance monetary policy. This scenario is a connection of financial dualism whereby there is a division of money markets into unorganised and organised in the Less Developed Countries. The hypothesis stresses that those LDCs depend more on monetary and fiscal policies. As claimed by Bordo and Levin [2] that digital currency can be an instrument for promoting monetary policy. Thrust the study of Benigo [3] suggested that in the periods of controlling interest movements digital currency can be employed as a measure. The easy monetary policy is maintaining artificially low-interest rates and such is helpful for the large industrial sector.

Based on the above nexus, this study employs market capitalization, the volume of crypto-currency and monetary policy rate in the South African economy to empirically demonstrates the praxis of financial dualism as an implication for concern Nigerians and its counterpart nations.

The digital currency as a means of financial dualism has received little or no regulatory acceptance. Despite the numerous effort and the focus to achieve a cashless economy, the regulatory of digital currency is seen not acceptance by many Africans. Outside the progress made in managing macroeconomic policies, the expectations on the existing digital environment to support a stable monetary policy, the performance and attention are still low. Following a series of reforms and policies on the cashless economy over these years by monetary authorities, it is expected that significant adaption and regularization of digital currency platform transaction is achieved. Many countries in Africa are envisaging fears as a Ponzi scheme that cannot help monetary policy since it does not function as a medium of exchange. Meaning, Dyson, Barker, and Clayton [4] claimed that through digital currency transactions the monetary policy can operate better in terms of price and volume which has also strengthened the policy instruments. Largely, the acceptance of crypto-currencies transactions in Africa seems to be relatively low.

In light of the above, there is an urgent need to measure the relationships between digital currency and monetary policy by testing the praxis of financial dualism in the South Africa economy. Specifically, to evaluate the relationships between the crypto-currency market capitalization and the monetary policy rate in the South African economy. Also, to analyse the relationships between crypto-currency market volume and monetary policy rate in the South African economy. The study worries and asks; to what extent does the market capitalization of crypto-currency relate to the monetary policy rate in the South African economy? Again, by how much does the market volume of crypto-currency relate to the monetary policy rate in the South
African economy? The findings will help and draws the attention of Nigerians and its counterpart in Africa considering a cashless economy using recent data.

The study digital currency and monetary policy; praxis of financial dualism in South the African economy will contribute significantly to financial economics subject. And therefore, Scholars will see the findings arising from this study as a reasonable addition to the existing body of knowledge. Also, findings arising from this study will be used by the general public for awareness and understanding of the functional relationship between digital currencies and monetary policy. Again, Presidents/Head of State, public policy managers including Central Bank of Nigeria, Securities, and Exchange Commission of various countries will find this useful in the formulation, management and/or reviews of Monetary and Capital Market policies. Finally, Industry Practitioners such as Bankers, investors, market/financial players and makers will find this study significant as it will expose the risk from the digital environment activities in the monetary policy. The study period is between 2013 and 2019 of South African information.

2. LITERATURE REVIEW

The monetary hypothesis is anchored on the basis that a change in the money supply will be the main driver of economic activities. In many developing countries, monetary policy is controlled by the central government through the apex banks. According to the modern monetary theory, the government should not contract its wallet twist to bear an underperforming economy rather fix the nation’s obstacles. So, since countries have the autonomy to increase and decrease the money supply. This suggests that countries can adopt any measures to achieve a stable monetary condition.

Digital /crypto-currency operates in the unorganised money market that influenced the monetary policy. Though this form of transaction is operating globally with little or no regulatory authorities, as such its liability does not back by assets of any institution. This transaction has not to be seen over the years as an innovation in some parts of the world since a virtually greater amount of money supply in the Euro is digital. The progress in technological advancement could be one of the factors behind the increase of crypto-currency transactions in the world. Although the currency still suffers an issue of acceptability as a medium of exchange due to its nature of volatility and lack of awareness. Technologies have in a way created innovation and also help for financial inclusion in the world over. Boeke [5] argued on systems interference and introduced the theory of social dualism of ancient and modern technology predominance. Boeke says that it is not good enough for a society to be sway by one social system. Hence the western and eastern world systems should move side by side. The theory stated that developed countries influence the less developed countries through the use of modern techniques and where the standard of living is high. On the other hand, the less developed countries are equipped with obsolete techniques and below social-economic life. This approach has gradually linked across the global village and re-engineered the abstraction of economic dualism.

The concept of economic dualism provides for the dualistic state of an economy of modern and traditional districts. This idea has a built-up framework with that of the financial dualism. Financial dualism is under the linkage between unorganised and organised money markets. It is Myint [1] that envisaged the rise of division of money markets into unorganised and organised in LDCs through financial dualism theory. According to Myint is aimed at generating surplus demand for foreign exchange in these poor countries to cultivate an overvalued exchange rate because of the fears of devaluation, monetary and fiscal policies emerges. The unorganised environment most times attained cartel components which induced the interest rate to bubble alongside risk and returns. Further, under such an environment the supply of money cannot leverage interest rates significantly. The hypothesis claimed that the rate of interest in the unorganised market is higher than the rate of interest in the organized money market which is concerned with the modern division. One of the aspects of the unorganised money market is a digital currency. Berentsen [6] opined that digital currency brings cheap electronic funds closer to individuals and firms. However, Niepelt [7] has caution and predicated that somebody may likely stand to bear the risk of instabilities in the future. Pieters [9] classified digital currency as a fragment of auto electronic funds for buying both digital and non-digital goods that are well instituted and incorporated into the global economy and called for regulations status to ensure the validity of the transactions. The countries in which this is controlled, the capital moved in the purchase of
gold, jewelry, real estate, and other speculative activities is because of the low rate of interest against investment. Hence such activities can subject the money market to remain ineffective. Meanwhile, Rahman [9] has observed no influence of digital currencies on monetary policy under socially adequate allotment. Some studies have discovered that digital currency transaction has a relationship with monetary policy. In a working paper series by Bordo and Levin [2] maintain that digital currency support monetary policy to promote price stability. More so, Nelson [10] claimed that digital currency presents little risks to the monetary policy environment. In a study by Mohammad and Davoodalaosseini [11] that many countries are fronting and pondering to issue a central bank digital currency due to the edge of expected interest. As supported by Beniak [12] that the apex banks are interested to test solutions since central bank digital currency can promote central bank interest rates and monetary policy. Again Benigno [3] postulated that financial dualism in a competing nature can reduce inflation pressure and safe guide interest rate maneuverings. However, it is necessary to empirically examine relationships between crypto-currency and monetary policy, the praxis of financial dualism in the South Africa economy as an implication for concerns Nigerians and its counterpart nations.

3. METHODOLOGY

The design for this study is anchored on country-specific, analytical, premised on already completed events and is macro. Based on the above, the ex-post facto research design is found fitting for the study. Onwumere [13] discovered that ex-post facto research design is suitable for a study that quasi-experimental. Conversely, in an attempt to expose the relationship between digital currency and monetary policy in the South African economy, this study adds in its design architecture, the econometric/analytical design to compliment the ex-post facto design.

The data sets for empirical estimation in this study have two major characteristics. Firstly, the data is secondary. Secondly, they are time series. Time series are data sets that follow regular time-frequency. In this study, quarterly data are used in the case of both the dependent and explanatory variables. In terms of sources, we will draw our data from the Central Bank digital currency and the South Africa Reserve Bank of various issues. As estimation necessities demand, some of the series may be transformed to improve their goodness for the purpose under pursuit. This study covers the South Africa environment with particular focus on some key crypto-currency aggregates like Market value, and Volume, and monetary policy rate for the period under study. It can arguably be said that the sets of data are in quarterly form from April 2013 to December 2019.

The theoretical leaning of this study is the Financial Dualism Theory (FDT) as espoused by Myint [1]. The theory takes into account the coexistence of organized and unorganized money market. The idea behind this theory is that monetary policy is generated by several common sensitivities factors in the money market. The central idea of FDT is that both regulatory and non-regulatory money market systematic factor affects the performance of the monetary policy. The theory in itself provides two relevant financial variables that include organised and unorganized money market so they need to be empirically determined.

Expressing the APT functionally appears thus:

$$MPR = f(Digital\ \text{environmental factors})$$  \hspace{1cm} (1)

Taking MPR to be Monetary Policy Rate indicator and Digital currency indicators such as Market value, the Market volume of crypto-currency, the study empirically estimate functional relationships as follows:

$$MPR = f(Mcap, Vol)$$  \hspace{1cm} (2)

From the theoretical standpoint, this study is designed to prove the reality or otherwise of the FDT using variables from the South African economy.

Generally, the regression form, following Neter, Wasserman, and Kutner [14], eqs. 1 and 2 can be rewritten in econometric form, thus:

$$MPR_t = \gamma_0 + \gamma_1 Mcap_t + \gamma_2 Vol_t + \varepsilon_t$$  \hspace{1cm} (3)

Where all the variables are as stated above and $\gamma_0$ is the constant (the value of the dependent variable when all the regressors are at zero); $\gamma_1$ and $\gamma_2$ are coefficient of the independent variables and $\varepsilon_t$ is the noise or error term.

The model’s variables of this study consisted of digital monetary policy as a broad dependent variable that is being influenced in the digital environment, which serves as independent variables. The dependent variables of this study consist of the monetary policy rate of the South...
Africa Reserve Bank and serve as the proxy for monetary policy. The independent variables of this study consist of market value, the market volume of crypto-currency of the Central Bank digital currency of South Africa. They serve as the explanatory variables for the digital currency of money market dualism.

The estimation procedure for this work followed Autoregressive Distributed Lag Estimations, Inferences- Test of Hypothesis and Diagnostic/Reliability Tests considerations. These sets of tests are designed to validate the goodness of the data sets for Unit Root stationarity of the variables. The traditional Augmented Dickey and Fuller (ADF) [15] test is adopted to show the unit root properties of the series following equation specified.

\[ \Delta y_t = \beta_1 + \beta_2 t + \delta y_{t-1} + \alpha_1 \sum_{i=1}^{n} \Delta y_{t-i} + \varepsilon_t \]  

(4)

Where the test is for \( H_0: \delta = 0 \) and \( H_1: \delta < 0 \).

The study adopted the ARDL method due to its advantage which includes, Efficiency in the face of small samples, it is a dynamic model and overcomes some problems that are common with the regularly used Ordinary Least Squares (OLS) also it accepts series with different orders of integration such as 1(1) and 1(0), Pesaran, Shin, and Smith, [16].

Lag selection will be based on the Bayesian Criterion generated automatically by the estimation software following the form of equation 5 below:

\[ BIC = \ln(n)K - 2\ln(\ell) \]  

(5)

Where:

- \( n \) represents either the sample size, the number of observations, or the number of data points in \( x \).
- \( k \) represents free parameters to be estimated.
- \( \ell \) represents the maximized value of the likelihood function for the estimated model \( M \) given as \( \ell = p(\hat{\theta}, M) \).

### 3.1 Error Correction Representation

After establishing a possible short-term run relationship through the error correction model will be used to test the speed of adjustment of monetary policy to the shocks emanating from the digital currency. This will follow the form specified below:

For the Model MPR as the dependent variable:

\[ \Delta MPR_t = \gamma_0 + \gamma_1 \Delta MPR_{t-1} + \gamma_2 \Delta Mcap_{t-1} + \gamma_3 \Delta Vol_{t-1} + \gamma_4 Mcap_{t-1} + \gamma_5 Vol_{t-1} + \gamma_6 \text{MPR}_{t-1} + \gamma_7 \text{Mcap}_{t-1} + \gamma_8 \text{Vol}_{t-1} + \xi_t \]  

(6)

All the variables are discussed above with combined modeling of the short-run coefficients in the error correction framework.

The prior expectations from the model's tests of the hypotheses are given as follows:

#### 3.2 Hypothesis One

- **H0**: There is no positive and significant relationship between the market capitalization of crypto-currency and monetary policy rate.

Controlling for volume with a market capitalization as the explanatory variables of interest, the model for the hypothesis is presented thus:

\[ MPR_t = \gamma_0 + \gamma_1 Mcap_{t} + \gamma_2 Vol_{t} + \varepsilon_t \]  

(7)

Therefore the prior expectation with regards to this will be greater than zero; i.e. \( \gamma_1 > 0 \)

#### 3.3 Hypothesis Two

- **H0**: There is no positive and significant relationship between the market volume of crypto-currency and monetary policy rate.

Controlling for market capitalization with volume as the explanatory variables of interest, the model for the hypothesis is presented thus:

\[ MPR_t = \gamma_0 + \gamma_1 Mcap_{t} + \gamma_2 Vol_{t} + \varepsilon_t \]  

(8)

Therefore the prior expectation with regards to this will be less than zero; i.e. \( \gamma_2 > 0 \)

To ensure that estimates are valid, efficient and unbiased inferences in this study, the diagnostic test contained in Table 1 shall be adopted.

Inferences in this study shall be made based on the outcome of the estimation approaches as well as conclusions drawn based on the tested hypotheses. The choice level of significance for all tests shall be 0.05 or 5% level. All estimations shall be done using version 10 of the E-views estimation software. The analysis for stationarity of the ADF unit root test is in Table 2 results.
4.1 Results and Discussion of Findings

Here hypothesis is tested at the 0.05 level of significance. A probability value of less than 0.05 implies that the variables used are not stationary and will be rejected or refuse to accept for analysis. The above is the guiding rule for this study.

Table 2 reports the Augmented Dickey-Fuller (ADF) unit root test results of the series used in the study. The table reveals that all the variables used in the models of study are non-stationary at level but became stationary after first level differencing. The evidence of stationarity is that all probabilities value 0.0052 of MPR, 0.0043 of Mcap and 0.0017 of Vol are less than 0.05. Hence all variables show in the table and used models are stationary, and integrated of order one i.e. 1(1) which implies retaining external shock for the short-term period.

Table 3 captures the results of ARDL in the short-term relationships between market capitalization and market volume of cryptocurrencies and monetary policy rates.

This section presents the Autoregressive Distributive Lag (ARDL). In the above table, the result of the coefficient of determination 0.895631 is relatively high and positively correlated. The result of 10.52297 values for t-Statistic is greater than 2 and shows sufficient evidence against the null hypothesis. To measure the goodness of fit of the model from the above results in the table that show the coefficient of correlation $R^2$ value of (0.895631)$^2$ 0.8021 * 100 translating to 80% is strong and fit, as it is above 50%. It indicates that the model is good enough and has the power to predict the variables used. The 20% variation may be attributed or explained by independent variables not captured in 2013 and 2019 respectively. It could also be a reason for balancing the variables in the equations and other variables not captured that were denoted as an error term. The adjusted $R^2$ (0.876062)$^2$ 0.7675 * 100 translating to 77%. This implies the addition of more explanatory variables $R^2$ is expected to reduce. While the result of S.E regression 0.229995 indicates the summary measurement base on the estimated variable of the residuals. The value of the log-likelihood 3.246617 displayed the difference between restricted and unrestricted version 10 of the E-views soft wear. To test the significance of the overall regression, the study used the results of the Probability F-statistic value of 0.000000 is less 0.05 in the table suggests that the explanatory variables are significant enough to explain the outcome significance of the study. The SD dependent variable value of 0.653306 shows deviation from the average 0.922300. This suggested that a 1% increase in the monetary policy rate will bring about 0.65% of the explanatory variables. The Akaike, Schwarz, and Hannan-Quinn criterion values of 0.075338, 0.27448, and 0.114214 respectively are low as it is been used to choose the competing models. Besides the lower, the value is better. The Durbin-Watson stat results of 1.895011 revealed no evidence of the first-order autocorrelation as the value is approximately 2 and within the range. The coefficient results reveal that the monetary policy rate exerts negatively with Vol (-7.95E-12) and Mcap (-5.72E-13), although there is no significance. Thus implies that in the long run increase when the effect of shocks is been neutralized by the passage of time.

4.2 Test of Hypotheses

Here hypotheses are tested at the 0.05 level of significance. This decision rule is guided by the probability value and level of significance of 5%. A probability value of less than 0.05 implies that the null hypothesis will be rejected or refuse to accept.
Table 2. ADF unit root test results

<table>
<thead>
<tr>
<th>Differenced variable</th>
<th>ADF – test statistics</th>
<th>Test of critical level</th>
<th>Order of integration</th>
<th>Probability value</th>
</tr>
</thead>
<tbody>
<tr>
<td>D(MPR)</td>
<td>-2.973722</td>
<td>-2.692358</td>
<td>-1.960171</td>
<td>1(1)</td>
</tr>
<tr>
<td>D(MCAP)</td>
<td>-4.238885</td>
<td>-3.831511</td>
<td>-3.029970</td>
<td>1(1)</td>
</tr>
<tr>
<td>D(Vol)</td>
<td>-4.695422</td>
<td>-3.831511</td>
<td>-3.029970</td>
<td>1(1)</td>
</tr>
</tbody>
</table>

Source: Extracted from E-Views 10

Table 3. ARDL test results

ARDL
Dependent Variable: MPR
Method: ARDL
Date: 03/10/20 Time: 11:08
Sample (adjusted): 2 21
Included observations: 20 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): VOL MCAP
Fixed regressors: C
Number of models evaluated: 4
Selected Model: ARDL(1, 0, 0)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPR(-1)</td>
<td>0.922300</td>
<td>0.087646</td>
<td>10.52297</td>
<td>0.0000</td>
</tr>
<tr>
<td>VOL</td>
<td>-7.95E-12</td>
<td>1.44E-11</td>
<td>-5.51378</td>
<td>0.5890</td>
</tr>
<tr>
<td>MCAP</td>
<td>-5.72E-13</td>
<td>1.31E-12</td>
<td>-4.35791</td>
<td>0.6688</td>
</tr>
<tr>
<td>C</td>
<td>0.895988</td>
<td>0.829206</td>
<td>1.080538</td>
<td>0.2959</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.895631</td>
<td>Mean dep var</td>
<td>9.812500</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.876062</td>
<td>S.D. dep var</td>
<td>0.653306</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.229995</td>
<td>Akaike info criterion</td>
<td>0.075338</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.846363</td>
<td>Schwarz criterion</td>
<td>0.274485</td>
<td></td>
</tr>
<tr>
<td>Log-likelihood</td>
<td>3.246617</td>
<td>Hannan-Quinn criteria.</td>
<td>0.114214</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>45.76765</td>
<td>Durbin-Watson stat</td>
<td>1.895011</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: p-values and any subsequent tests do not account for model selection.

Source: Extracted from E-Views 10

4.3 Hypothesis One

\(H_0_1: \) There is no positive and significant relationship between the market capitalization of crypto-currency and monetary policy rate.

\(H_a_1: \) There is a positive and significant relationship between the market capitalization of crypto-currency and monetary policy rate.

From table 3 above, the result of probability value 0.6688 is greater than 0.05 as such indicate no significant relationship between Mcap and monetary policy rate. Therefore, there are no significant relationships between the market capitalization of crypto-currency and monetary policy rate in the short-term.

4.4 Hypothesis Two

\(H_0_2: \) There is no positive and significant relationship between the market volume of crypto-currency and monetary policy rate.

\(H_a_2: \) There is a positive and significant relationship between the market volume of crypto-currency and monetary policy rate.

Again, from Table 3, the results of probability value 0.5890 is greater 0.05 as such reveal no significant relationship between market volume and monetary policy rate. Therefore, there are no significant relationships between the market volume of crypto-currency and monetary policy rate in the short-term. So, there is no relationship between market capitalization, and market volume and monetary policy rate. This
implies that Vol and Mcap of crypto-currency do not influence the monetary policy rate in the short term. These results invalidate financial dualism theory that claimed relationships with the unorganised money market. Therefore, the short-term period’s activities of the unorganised money market do affect monetary policy. The above findings could be a result of inadequate knowledge background about the digital currency environment. It could also be a result of a lack or poor level of acceptability in terms of regulations on the side of the government. Furthermore, there seems to be a loss of public confidence in the digital environment in the instance of hackers and other cyber-related crimes.

5. CONCLUSION

In conclusion, the praxis of financial dualism in the South African economy measuring the relationships between digital currency and monetary policy did not show significant evidence. From the empirical results, the findings indicate that activities of the unorganised money market do not influence monetary policies hence, the digital currency operates independently. However, a positive and significant relationship existed in monetary policy. This goes on to say that monetary policies in the South African government are strong enough to accommodate the financial dualism activities. These results however discredit and do not follow the financial dualism theory during the short-term periods.

6. RECOMMENDATIONS

Based on the findings, the study, therefore, recommends as follows:

1. Adequate education and public awareness about the digital environment on currency transactions uphold digital currency as a legal tender and medium of exchange.
2. The federal government through the ministry of finance and the Central Bank of Nigeria should accept, and regulate the digital currency environment for tax advantage that will translate to revenue addition.
3. Nigerian should embrace the digital environment to foster financial inclusion and as a source of a business platform.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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