

Social Media-Based Digital Financing and Sustainability of TVET-Enabled Microenterprises in Ilaro Town, Nigeria.

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Abstract: *Micro and macroeconomic benefits of an increased presence of microenterprises in developing economies are still unsatisfactory mainly due to finance-induced sustainability issues. This study examines the impacts of social media financing on the economic sustainability of sampled 143 TVET-induced microenterprises in Ilaro town, Nigeria. A simple random sampling with a weighting method is employed to collect cross-sectional survey data from operators/managers of TVET-induced microenterprises in the study area. Unlike what is common in many survey-based studies, this study applied the weighted least square method at a 5% significance level to correct for sample selection bias (and random errors) and subsequently estimates the impacts of financing via Facebook, X, and WhatsApp on micro firms' economic sustainability index. The study found that measured social media-based digital finance (WhatsApp and X platforms) produced positive and significant impacts on the economic sustainability index of microenterprises in Ilaro town, Nigeria. However, the positive impact of Facebook financing is found as an insignificant predictor. The study concludes that offering financing support through social media technology (specifically, WhatsApp and X platforms) has important positive implications for ensuring sustainable growth of micro-businesses in Nigeria particularly in Ilaro town. Consequently, the study recommends that both owners (and operators) and managers of TVET-induced microenterprises in Ilaro town should embrace the use of social media (particularly WhatsApp and X platforms) to seek financial support to stimulate the sustainability of their business operations. Also, a need for the upgrade of digital and internet infrastructures in the country is suggested for the government.*

Keywords: Financing, Technology, Social Media, Sustainability, Weighted Least Square

Introduction

Micro and macroeconomic benefits of an increased presence of microenterprises are vital to the economic growth and development of countries where the operations of these micro firms are sustainable over time (Abduraheem, Ogungbo & Onwuka, 2023). They are sources of employment opportunities and mean job creation for large segments of the population, particularly in developing countries. However, the economic and social benefits of microenterprises are often limited in developing countries due to a lack of operational sustainability hugely accounted for by limited financial resources (Djakasaputra, 2021; Namibia Ministry of Finance and Public Enterprises [NMFPE] and United Nations Development Programme [UNDP], 2023). The sustainability issue is more precarious for micro firms in these economies due to the nature of size and lack of recognition by financial institutions including informal lenders. Meanwhile, offering financial services through

digital applications has been recognized as an efficient and effective way of improving the sustainability of Micro enterprises (NMFPE & UNDP, 2023) along with Small and Medium Scale Enterprises (SMEs) in developing nations (Abduraheem *et al.*, 2023; Djakasaputra, 2021; NMFPE & UNDP, 2023).

Unfortunately, few recent studies on the relationship between digital finance and the sustainability of businesses (micro, small and medium in focus) have overlooked the relevance of social media-based digital finance via internet-enabled social applications such as Facebook, WhatsApp, Instagram, X and among others (for instance, see Abduraheem *et al.*, 2023; Beirne & Fernandez, 2023; Mu, Liu, Tao & Ye, 2023; Ren, Zeng, & Zhao., 2023; Xue, Dang, & Zha, 2023). Further available evidence suggests that research study about TVET-induced microenterprises is non-existence in micro firm literature. Nonetheless, this study contends in line with findings by Feyen, Natarajan and Saal (2023) that owners and managers of microenterprises in developing countries are increasingly



using internet-enabled mobile phones that make their online presence on various social media fora more feasible than before. Therefore, estimating the impacts of social media digital finance on the sustainability of micro firms particularly TVET-led microenterprises as the crux of the current study is critical and imperative for long-term growth and development of micro businesses in developing economies like Nigeria.

Furthermore, apart from the identified gap the study additionally contributes to the existing literature on sustainable development by essentially concentrating on the economic sustainability aspect of sustainable development. This is important to provide comprehensive empirical evidence on the role of digital finance in promoting the economic sustainability of micro-firms in the study area. The current study argues that micro firms need to be economically viable and sustainable before they can invest in the environment, people and community where they operate. In other words, the study evaluates within the weighted least square (WLS) framework the impacts of social media financing via Facebook, WhatsApp and Twitter (now, “X”) on the economic sustainability index of microenterprises in Abeokuta metropolis using a cross-sectional survey data.

Literature Review

TVET relates to all kinds of education that involve studying technology and related sciences and achieving practical knowledge, skills, attitudes and discernment of various occupations of different economic sectors and social life (United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2021). By conceptualization, TVET-induced microenterprises in the context of the current study refer to micro firms established from knowledge gained by college/university graduates through technical and vocational education and training programmes. These types of microenterprises are mostly technologically inclined due to the use of modern technology, electronic and phone devices. They can be mostly found in the information and communication technology industry, service, education, and telecommunication sectors. Interestingly, TVET helps graduates acquire technical skills and knowledge that can boost their capacity to establish at least micro firms and contribute meaningfully to the sustainable economic development of an economy through increased productivity and economic advancement.

However, the ability of these businesses (microenterprises in focus) to offer significant benefits at micro and macro levels in an economy is hinged on sustainable funding. Thus, the lack of adequate funding of microenterprises in developing countries in part accounts for limited impacts of micro firms towards sustainable development of these economies (Allen, 2020). Then, exploring innovative

digital financing like social media finance can significantly aid the operational performance of microenterprises

including TVET-induced ones to boost the sustainable development of countries particularly developing countries like Nigeria. Social media is a technological-driven interface that facilitates communication between people through certain platforms. Some of the most common social media platforms offered with mobile devices (e.g. tablets, iPads and smartphones) are Facebook, Twitter (or X), WhatsApp, Google, Instagram, Instabloc, Nairaland, LinkedIn, YouTube, TikTok and others. It has been established by extant literature that micro-enterprises can leverage the benefits offered by social media to effectively and efficiently compete with larger firms (see Ghezzi, Gastaldi, Lettieri, Martini, & Corso, 2016; McCann & Barlow, 2015; Vatanasakdakul, Aoun, Hidayah & Putra, 2020) particularly in the area of financing.

Furthermore, the relationship between social media-based digital financing and the sustainability of TVET-induced microenterprises in this study is explained by the diffusion of innovation theory developed by Rodgers (1962). The social science theory demonstrates how a new idea as innovation gains acceptance and spreads (or diffuses) through a social system over time. In this context, it suggests that financial services providers can diffuse information about their products and services through social media platforms to microenterprises to create value in ameliorating financial constraints faced by these members of a social system (Locket, 2018; Zhang, Guo, Hu, & Liu, 2017). The essence of this diffusion is to accelerate the adoption of social media financing to serve as an alternative innovative financing model to traditional means of funding for microenterprises. Empirically, data-driven evidence from Asia (China, in particular) suggests that there is a positive and significant relationship between digital finance and sustainable development index – ESG (environmental sustainability, social sustainability and governance) (Mu *et al.*, 2023; Ren *et al.*, 2023; Xue, Dong & Zha, 2023).

The study by Xue *et al.* (2023) employed secondary data from Bloomberg and the China Digital Financial Inclusion Index of Peking University to analyse how digital finance affects firm sustainability for a period between 2010 and 2019. Using the fixed effect estimation technique, the study observed that the ESG performance of firms in China is positively and significantly influenced by digital finance. Consequently, it concludes that digital finance promotes sustainable development in China. Similarly, Ren *et al.* (2023) and Mu *et al.* (2022) found a positive relationship between digital finance and corporate ESG through panel analysis (fixed effect technique) of data drawn from China A-listed firms between 2011 and 2020. However, the focuses of Xue *et al.* (2023); Ren *et al.* (2023) and Mu *et al.* (2022) were basically and extensively devoted to listed China firms which are dominated by large firms thereby excluding the micro



level impact of digital finance. In Nigeria, Saka and Isiaka (2023) had earlier confirmed through Poisson regression the existence of social-media financing opportunities among microenterprises in the Abeokuta metropolis (Nigeria). However, the study concludes that the concept of social-media finance is not yet a reality to most microenterprises in the Abeokuta metropolis as it is relatively new to many micro-business owners.

Advanced Structural Equation Modelling (SEM) based study by Saka and Akinde (2023b) investigates how social-media financing awareness could be improved among Nigeria microenterprises through Fintech operations using primary data. The study found via PLS-SEM that digital payment, digital lending and digital wealth management are significant FinTech drivers to accelerate awareness of social-media financing among microenterprises in Nigeria. However, existing social media finance empirical literature in developing countries like Nigeria (e.g. Saka & Isiaka, 2023; Saka & Akinde, 2023b) have failed to include any sustainability index in data analysis procedures. More worryingly, there is a lack of social media finance studies in any rural area in Nigeria despite the increasing use of social media with smartphones among the rural populace in the country. Meanwhile, qualitative evidence of the relevance of digital financial services for sustaining the operations of small-scale businesses is provided by Abdullaheem *et al.* (2023) in Nigeria. In summary, despite evidence of the positive impact of digital finance on the sustainability of firms no study has empirically linked social media finance with the economic sustainability of microenterprises in literature.

Methodology

This study is conducted among TVET-enabled microenterprises in Ilaro town, a rural area in Ogun State. The town is a host to many private business owners who mostly are micro firms. A large proportion of these microenterprises engage in technology-related works at micro levels. Examples include smartphone repairs, computer hardware repair services, computer software design and development, digital media services, vehicular mechanics services and among others. Interestingly, these technologies-related services are largely TVET-enabled. Therefore, identifying sustainable financing models such as social-media finance can stimulate the economic sustainability of these micro firms and contribute meaningfully to the economic advancement of Ilaro's local economy and Ogun State in Nigeria. This study uses a survey research design to elicit information from the population of owners of TVET-enabled microenterprises through the sample. To achieve the objective of this design, a population size is required to determine the appropriate sample size. However, the population of owners and/or managers of TVET-enabled microenterprises in Ilaro town is unknown. This is due to

a lack of accurate data from government quarters or from any micro trade association in the study area. To counter

this incidence, a robust scientific procedure for determining the appropriate sample size as established by Charan and Biswas (2013) was duly followed. This procedure involves two steps.

The first step is to establish through a pilot study the standard deviation of the expected mean number of owners and/or managers of TVET-enabled micro firms in the area which the study grouped into four business clusters. The conduct of a pilot study is required if such standard deviation has not been previously determined by any study (Charan & Biswas, 2013). The business clusters identified in this study are The Federal Polytechnic, Ilaro cluster, Deuteronomy cluster, Orita cluster and Library cluster. These four business areas host a large number of TVET-enabled micro firms. In the pilot study, a random of five owners /managers were selected in each cluster to assume an average number of owners/managers of TVET-enabled micro firms in each business cluster. In the second stage, the sample size formula developed by Charan and Biswas (2013) was applied to estimate an appropriate sample size for the study and stated thus:

$$S = \frac{Z_{t-\left(\frac{\alpha}{2}\right)^2} \times SD^2}{e^2} \dots (1)$$

Where,

S = Sample size

$Z_{t-\left(\frac{\alpha}{2}\right)^2}$ = standard normal variate at 5% type 1 error (1.96)

SD = standard deviation (30.5) obtained from the pilot study analysis

e = absolute precision or error margin (5%)

Computation from equation 1 yields 143 as the sample size.

The sample size, 143 respondents, was allocated proportionally to business clusters based on the observed large concentration of TVET-enabled micro firms in each business cluster as obtained during the pilot study. However, an accurate sampling decision was difficult to arrive at. For instance, the Library Business Cluster has a low but much-dispersed concentration of TVET-enabled micro firms. Therefore, to prevent the issue of unequal variance (heteroscedasticity) due to sampling bias which could cause oversampling or under-sampling the study makes use of a weighting system. The sampling distribution and estimated weights are contained in the following Table 1 as thus:

Table 1: Study Sampling Distribution

S/n.	Business Cluster	Sampling Distribution	Weight
1.	The Federal Polytechnic, Ilaro	36	2
2.	Deuteronomy	36	2
3.	Orita	36	2
4.	Library	35	4



	Total	143	
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Source: Authors' Field Work (2024)

Consequently, the study employed a random sampling technique to select the units of analysis from each of the business clusters to administer among them a well-structured questionnaire on social media usage. The administration of the questionnaire was carried out by the researchers and two other Research Assistants from March 20 to April 24, 2024. In terms of the econometric modelling procedure, the study adopted the weighted least regression model (WLS).

The study Weighted-Poisson model was specified following adjustment to the GLM-based Poisson regression model earlier developed in Saka and Isiaka (2023) as thus:

$$E[SMF_i|SOC_i] = \exp(\alpha + \beta_{SOC}SOC_i) \dots (1) \text{ (Saka \& Isiaka, 2023)}$$

Where;

E or *LN* = exponential function (log-linear), a canonical link for Generalized Least Method with Poisson distribution; *SOC* = Socio-economic Factors (education, income level and social media usage); *i* = individual sampled microenterprise owner; β_{SOC} = slope coefficient of *SOC*.

The initial study weighted least regression is specified in equation 2 as thus:

$$E[ESI_i|SMF_i] = \alpha + \sum_{i=1}^n w_i \beta_{SMF} SMF_i \dots (2)$$

Where,

ESI = Economic Sustainability Index of TVET-enabled micro firms expected to be determined through Principal Component Analysis. Again, the measurements of *ESI* in this study follow the United Nations (2015) established standard for measuring the economic sustainability of an enterprise.

SMF = Social Media Finance; w_i = individual weight of an observation within a business cluster; *n* = number of observations

Specifically, the parameters of interest in equation 4 are further decomposed in weighted least square (WLS) equation 3 as:

$$[ESI_i|SMF_i] = \alpha + w_i \beta_{FCB} FCB_i + w_i \beta_{WAP} WAP_i + w_i \beta_{TWI} TWI_i \dots (3)$$

Where;

FCB = Facebook finance; *WAP* = WhatsApp finance; *TWI* = Twitter finance

Lastly, equation 3 is analysed with the least square estimation method at a 5% level of significance using STATA 12.1 as statistical software. Mathematically, the study *a priori* expectation is that $\beta_{FCB}; \beta_{WAP}; \beta_{TWI} > 0$.

Presentation of Results

This subsection provides estimation outcomes of the study descriptive and inferential analyses in Tables 2 and 3 respectively.

Table 2: The Study Descriptive Results

S/n	Ind.	Cat.	Freq.	Perce nt (%)	Cum. (%)
1.	Most Social Media Use	Facebook	16	11.94	11.94
		WhatsApp	100	74.63	86.57
		Twitter (X)	3	2.24	88.81
		Instagram	8	5.97	94.78
		Tiktok	7	5.52	100.00
		Total	134	100	
2.	Use Social Media Finance	Yes	108	80.60	80.60
		No	20	14.93	95.52
		Not sure	6	4.48	100.00
		Total	134	100	
3.	Platform Used for Financing	Facebook	36	26.87	26.87
		WhatsApp	66	49.25	76.12
		Twitter (X)	11	8.21	84.33
		Instagram	3	2.24	86.57
		Others	2	1.49	88.06
		Missing	16	11.94	100.00
		Total	134	100	

Note: Ind. = indicator; Cat = Category; Freq. = Frequency; Cum = Cumulative Percentage

Source: Authors' Computation from STATA 12.1 Outputs (2024)



Table 3: Weighted Least Regression Results

<i>Variable DV: ESI</i>	<i>Coef.</i>	<i>Robust Std. Error</i>	<i>t</i>	<i>p- value</i>
FCB	.04	.05	0.81	0.421
WAP	.11	.05	2.23	0.027
TWI	.18	.04	4.42	0.000
_cons	-1.71	.22	-7.65	0.000
Degree of Freedom (3, 130)			29.51	
F-statistics (p- value)				0.000
R-squared			.60	
Number of Observations = 134				

**Source: Authors' Computation from STATA
12.1 Outputs (2024)**

Interpretation and Discussion of Results

In Table 2, the descriptive result shows that 134 observations were used for the final analysis. This implies that out of 143 administered questionnaires, only 134 were returned and filled. The retrieval rate represents 94% of the total expected responses. Such a response rate has been considered appropriate and suitable for the WLS estimation method which is even more robust for small samples. From Table 2, the respondents use various degree of social media platforms covered in this study such as Facebook, WhatsApp, X, Instagram and TikTok. The Table shows that 74.63% of the respondents regularly use WhatsApp for various reasons followed by Facebook which represents 11.94% of the population. However, the use of other platforms such as X, Instagram and TikTok for different reasons is not common among the study respondents. For instance, just an armful 6% of the respondents asserted that they use Instagram and Tiktok at each category level while only 2% use X regularly for many functions. This result implies that WhatsApp is the most common social media platform owners and/or managers of TVET-enabled microenterprises use for diverse purposes.

Interestingly, the result in Table 2 indicates that the majority of respondents approximately 81% claimed that they use social media for financing while almost 15% of the respondents have not used any social media to finance their businesses in the last 12 months. More than 4% of the respondents were not sure if they had used social media for finance in the last twelve months. This result shows that a large proportion of owners and/or managers of TVET-enabled micro firms in Ilaro town have embraced the use of social media for financing business activities in the last year. The observed descriptive evidence is an improved finding to earlier results found by Saka and Isiaka (2023)

which shows that the use of social media for financing was just evolving in the Abeokuta metropolis at the time of their research. However, the use of social media for financing varies substantially according to different social media platforms. From Table 2, the largest proportion of owners and/or managers of TVET-enabled micro firms in Ilaro town use WhatsApp to obtain necessary finance (representing 49.25%) followed by the use of Facebook with almost 27% of the total population. The use of X to raise finance was estimated at 8.21% of the total observed population while the use of Instagram (2.24%) to get needed finance was not common among owners and/or managers of TVET-enabled microenterprises in the study area. Overall, an approximated 86% of the total study population used one social media platform or the other for financing business activities in the last year.

Moreover, the WLS results in Table 3 demonstrate the impacts of social media financing as digital finance on the economic sustainability of TVET-enabled microenterprises in Ilaro town. The economic sustainability index (ESI) of the firm was determined through Principal Component Analysis (PCA) which previously identified one component for all measures of economic sustainability developed by the United Nations (2015) at the firm level. The PCA analysis which produced ESI indicates that only one component produces an eigen value greater than one and as such one component was employed in line with the Kaiser criterion. From Table 3, all explanatory variables of the study produce positive impacts on the economic sustainability of TVET-enabled microenterprises in the study area. However, the use of Facebook financing (FCB: *coef.* = .04; *p-value* = .421) was found to be statistically insignificant in positively influencing the economic sustainability of micro-firms in the study area. On the other hand, WhatsApp financing (WAP: *coef.* = .11; *p-value* = .027) and X (formerly, twitter) (TWI: *coef.* = .18; *p-value* = .000) financing positively and significantly affect the economic sustainability of TVET-enabled micro firms in Ilaro town at adopted 5% significance level.

The use of robust standard error in column three of Table 3 to address the issue of heteroscedasticity due to random errors shows minimum variance levels of model residuals. Thus, efficient fitting of the study WLS model. Again, the overall model fitness as revealed by the probability of f-statistics in Table 3 indicates further the reliability and efficiency of the study model to provide accurate inferences. The value of R-squared as obtained in Table 3 shows that a 60% level of variation in the economic sustainability of TVET-enabled micro firms in Ilaro town is explained by digital financing (in the context of social media financing). The study observed evidence of a positive relationship between social media financing (WhatsApp and X) and economic sustainability of TVET-led micro firms in Ilaro town, Nigeria is consistent with previous empirical findings in the literature (e.g. Mu *et al.*, 2023; Renet *al.*, 2023; Saka & Isiaka, 2023; Xue *et al.*, 2023).



Conclusion and Recommendations

This study investigates the economic sustainability of TVET-enabled micro-firms in a rural area relative to the use of innovative social media-based financing. A robust heteroscedasticity corrected weighted least square estimator was employed to test the hypothesis that an innovative social media financing model increases the economic sustainability of TVET-led microenterprises in Ilaro town, Ogun State, Nigeria. The study found that the social media financing model (via WhatsApp and X) offers significant impacts to promote the economic sustainability of TVET-enabled micro firms in Ilaro town, Ogun State. This finding suggests that the funding issue faced by TVET-enabled firms in Ilaro town can be practically solved through WhatsApp and X financing mechanisms. The inability to make use of full expected data due to time concerns is a reasonable limitation of the study. However, the application of weighted least square which produces efficient estimates for a small sample practically minimizes error variance to overcome the problem of a small sample and thus increases accuracy and generalization of the study results.

Nonetheless, future research is still expected to be carried out at a large scale level. More importantly, this study appears to be the first in the literature to provide empirical and robust sustainability estimation of micro firms within the social media finance framework. The study, therefore, affirms that the economic sustainability of TVET-enabled micro firms in Ilaro town can be improved significantly with increased adoption of social media financing using WhatsApp and X platforms. The study recommends that owners and/or managers of microenterprises particularly TVET-induced micro firms should explore the use of WhatsApp and X platforms for funding their businesses. Again, the government should launch some financing initiatives through WhatsApp and X for the sustainability benefits of microenterprises. Also, a need for the upgrade of digital and internet infrastructures in the country is suggested for the government. Lastly, initiators (or innovators) of other social media platforms like Facebook should consider launching advanced financial products and services that could significantly improve the economic sustainability of microbusinesses.

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