



An Empirical Analysis of Loan Repayment Flexibility on Delinquency Rates of Cocoa Farmers in Cross River State

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ABSTRACT

This study examined the impact of loan repayment flexibility on cocoa farmers' delinquency rates in Cross River State, Nigeria, using a cross-sectional dataset. This was exigent given that delayed payment impacted banks' portfolios and their capacity to extend more loans, not just to cocoa farmers but to farmers generally. Based on the study's specific objectives of examining the repayment flexibility of the lending banks in the study area and analyzing its effect on delinquency, a questionnaire was administered to 92 cocoa farmers. Data obtained were analyzed using descriptive statistics and a probit regression model. The results revealed that all the banks offered flex loans to the farmers, and at least 41.3% of the farmers had a one-year moratorium after disbursement to start repayment, with repayment due when the crop was sold. In terms of the probit results, age (-.0102684, $P < 0.05$), household size (.0331566, $P < 0.10$), cocoa business experience (-.011093, $P < 0.10$), loan amount received (4.96e-07, $P < 0.001$), and the lending bank (.01768, $P < 0.10$) had the greatest impact on delinquency rate, with household size having the highest – 3.31%. The implication is that larger cocoa farmers' households have a greater chance of being delinquent or failing to repay their loans by 90%. Therefore, the paper suggests a redesign of the flex loan terms by the lending banks targeted at co-creating a sustainable future with the farmers by working on these impacting variables.

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INTRODUCTION

Cocoa is an important cash crop grown in the humid tropics, with over 11.5 million hectares planted in 57 countries worldwide (Kongor *et al.*, 2024). The cultivated land area falls between 10°N and 10°S of the equator, with the majority of the cultivated land (7.9 million hectares) in Africa, 1.9 million hectares in the Americas, 1.6 million hectares in Asia, 0.15 million hectares in the Caribbean, and 0.12 million hectares in Oceania (FOASTAT, 2023). Nigeria is ranked as the fourth largest producer in the world and third in Africa, contributing about 7.7% of the global supply ("Nigeria's New Inflation + Cocoa Production Boost", 2025). Nigeria's contribution to the international market implies that the crop occupies an important place in the country's economy. Historically, cocoa and groundnut were the country's major earners before the discovery of crude oil. According to Alexis (2024), cocoa accounted for over 50% of the Gross Domestic Product (GDP) and 64.5% of the export earnings from 1960-1969; however, the shift towards oil exploration in the 70s led to a decline in production. Although this affected production, the crop still contributes to the GDP and still holds sway as a major agricultural export. According to "Reviving the Cocoa Industry in Nigeria" (2017), cocoa is the second largest export commodity after oil and gas, and contributed 0.05% to Nigeria's GDP in 2016. In 2023 and 2024, it generated N358 billion and N538 billion (\$238 Million and \$358 Million, at N1500 to \$1), respectively; making it the highest agricultural contributor with a contribution of 2.62% alone to the country's total export in the third quarter of 2024 (Jaiyesimi, 2024; "Nigeria's New Inflation Reality + A Cocoa Production Boost", 2025). In other words, the cocoa industry in Nigeria has not only contributed to the foreign exchange earnings but has been a veritable means of livelihood and employment for

numerous smallholder farmers, who are the backbone of the production process in many rural areas. According to Nkang *et al* (2009), this group of farmers is the major producers, with an average farm size of 1-5 hectares.

Although Nigeria sits as the fourth largest producer of cocoa in the world, production is carried out in 10 out of the 36 states that make up the country and is concentrated in these states because of the enabling factors that permit the crop's growth. Cross River State, which is the second largest producer after Ondo, contributes more than 25% of the overall production. Like in other states of the federation, the cocoa industry in Cross River has enormous potential for growth, but it's currently underutilized. Low yield, disease incidences, pest attacks, aging trees, and near absence of processing facilities are some of the factors inhibiting the industry's growth and potential. Addressing these challenges and increasing investment and value addition requires increased financing of the industry. Granted that the average annual price of cocoa beans in the international market in 2024 (\$8,587/Mt) should ordinarily be enough to boost production, many small-scale farmers were caught in the web of this boom and were ill-prepared to take the necessary steps towards revolutionizing the industry, and so either misapplied or mismanaged the boom.

The price, however, capitulated to \$3400 as at April, 2026; further making things difficult for the farmers. The irony is that the boom lasted for a very short while. The implication - farmers all went back to the era of building capacity and boosting production with supplementary and borrowed finance.

Consequently, farmers sought and continue to seek credit to increase production by expanding cultivated area and to purchase necessary inputs with the hope of another boom in

the near future. To cope with this exigency, many farmers borrowed from both formal and informal sources and were bound by loan terms that were a bit stringent and difficult, particularly with most formal institutions in Nigeria where loans are rarely flexible irrespective of the kind of business – agriculture or non-agriculture. In other words, most loans, especially from commercial banks, are standardized, and this seriously impacts the agricultural sector since most aspects are seasonal, particularly the crop production sub-sector. The implication – inability of borrower farmers to meet up with terms during the crops' off-season, arising principally from the imbalance in expenditure and revenue. This causes some farmers to either default or be delinquent in fulfilling their loan obligations. This is the present situation of cocoa farmers in Cross River State. While standard loans may be good for farmers who intend to start a new farm because it requires bulk capital, flex loans are advised for farmers with already established farms and who probably need them for certain operations of the farm.

While default is more severe and usually a declaration that a borrower has failed to meet the loan obligations (say unable to pay between 90-120 days), delinquency is a temporary failure to make a scheduled payment on time, say in less than 90 days (Eyo et al, 2013). In other words, delinquency is typically measured by the number of days or months that have passed after the due date of the payment. The study is focused on delinquency and not default because of issues surrounding repayment of these loans as expressed by most formal lenders. Many are in agreement that though the farmers try to live up to their obligations, the delayed payment affects the banks' portfolio and ability to extend more loans to potential borrowers. Farmers, on the other hand, observed that the inflexibility of the lenders stifles the farms' financial resources, making it difficult to meet other demands. In addition to this, while many studies' foci have been on default and loan performance as well as its implications (Dadson, 2012; Ezihe et al, 2016; Simachew and Beshier, 2020), this study is different by considering only the impact on loan performance, and for a crop that is very key in Nigeria's economic dynamics.

It is consequent on this that this study sought to determine the factors affecting formal financial institutions' loan flexibility with respect to agricultural peculiarities and particularly cocoa production in the study area, examined the repayment flexibility of the banks, and the effect of flex loans on cocoa farmers' delinquency.

MATERIALS AND METHODS

Study Area

The study area is Cross River State, which is in the South-South geographical belt of Nigeria and lies on Latitudes 4°28'N and 6°55'N and Longitudes 7°50'E and 9°28'E of Greenwich Meridian. The State occupies a total land area of 22,342 sq meters, with an estimated population of 4,406,200 persons as at 2022 (National Bureau of Statistics-NBS). It is

surrounded by states such as Benue, Akwa Ibom, and Ebonyi, with its south bounded by the Atlantic Ocean and east by the Republic of Cameroon.

The vegetation of the state transitions from mangrove and swamp forest around the coastal south to montane and savannah woodland in the north. This sustains the temperature at 28°C per annum, with the rainfall varying from 1760mm in the north to 3100mm in the south. The soils – *utisol* and *alfisol*, together with the prevailing climatic conditions, support the growth of crops such as cocoa, oil palm, plantain, banana, cassava, yam, cocoyam, and assorted leafy vegetables. Fishery production is also abundant as the state is surrounded by water, with marine, artisanal, and inland catches observed in markets and other places in the state. Livestock animals such as goats, sheep, pigs, and chickens are also a common sight in the study area.

With three agricultural zones of Calabar, Ikom, and Ogoja, the 18 Local Governments that make up the state are divided along this line of zones based on the crops produced and the prevalent vegetation. Being the commercial nerve centres of the three zones, Calabar, Ikom, and Ogoja also boast of all the major commercial banks in Nigeria, such as First Bank, Access Bank, United Bank for Africa (UBA), Zenith Bank, Guaranty Trust Bank (GTB), First City Monument Bank (FCMB), Stanbic IBTC, Ecobank, and approximately 10-15 licensed Microfinance banks spread across all the zones of the state (Ajah et al, 2025).

Sample Size/Sampling Procedure

Out of the 18 Local Government Areas that make up Cross River, cocoa is produced in 14, with Akamkpa, Odukpani, and Biase in Calabar zone; Abi, Yakurr, Obubra, Ikom, Etung, and Boki in Ikom zone; and Ogoja, Obudu, Obanliku, and Yala in Ogoja zone. However, Ikom – which is a major commercial hub of the crop, Etung and Boki, also widely regarded as core cocoa belts, were purposively selected for this study. Six (6) cocoa farming communities: Ofutop, Nde, Akparabong, Nta/Nselle, Abijinkpor, and Abanyum were also purposively selected based on their cocoa production history (Nkang et al, 2009). A list of cocoa farmers was obtained from the Cocoa Farmers Association with a frame of 1720 farmers on the list. Out of this number, 1100 had borrowed in the last 5 years, which was the basis for the selection of respondents for the study. From 1100 borrower-farmers, the Taro Yamane formula as given below was used in calculating the sample size of respondent-farmers.

$$n = N / 1 + N(e^2)$$

where n is sample size, N is the population size, and e ($\pm 10\%$) is the level of precision.

Proportionate sampling was then applied for the different communities based on borrower-farmers from the communities. A random numbers Table was then used to sample the respondents. Table 1 presents the calculation of the proportionate sample size from the 6 communities.

Table 1: Sample Size of Respondent-Farmers

Farming community	Number of cocoa farmers who borrowed from the bank	Sample size selected for the study
Ofutop	260	22
Nde	185	15
Akparabong	141	12
Nta/Nselle	162	14
Abijinkpor	181	15
Abanyum	171	14
TOTAL	1100	92

For the banks, all the commercial and microfinance banks in the study were census-sampled, and they were 11 in number.

Data Analysis Procedure

This study used both descriptive and inferential statistics in achieving its aim. Factors affecting loan flexibility as well as repayment flexibility of the different banks were analysed descriptively, while loan flexibility effect on delinquency was analysed using a probit regression model. The model is expressed thus:

$$Q_{it} = \alpha + \beta.RP_i + \sigma.y_{it} + S_t + \delta.z_i + \varepsilon_{it}$$

Where;

Q_{it} = Dichotomous latent variable (1,0) indicating whether at least 1 installment of a loan disbursed in year t to a cocoa farmer i was delinquent when due.

α = Constant

RP_i = Number of loan installments

Y_{it} = Vector of client and loan characteristics

Cocoa business income (In naira)

Fixed assets (In naira)

Expenses (In naira)

Disbursed loan amount (In naira)

Age (years)

Gender (male =1, female = 0)

Marital status

Family size (number of persons in a household)

Cocoa business experience (number of years in the business)

S_t = time constant for the years t when loans were disbursed

Z_i = Vector of dummy variables for the banks involved in the disbursements

RESULTS AND DISCUSSION

Institutional Factors of the Banks

In Table 2, some banks' factors in granting loans to the farmers are presented. According to the Table, all the sampled banks granted graced period to cocoa farmers in the study area, but 36.4% of the banks only gave loans based on farmers' income. While 73% of the banks were in agreement that being flexible actually enhanced repayability, only 27.27% gave concessions to farmers to resume payment during the crop's peak season, with 63.6% sticking to standard repayment terms – monthly payment. Although 45.5% of the banks offered only standard loans, all the banks were of the view that most flex loans offered to cocoa farmers usually returned delinquent. This perhaps explains why the other 50% of the banks resorted to offering only standard loans to the farmers.

Table 2: Institutional Factors of the Banks

Bank factors	Variables	Frequency	Percentage (%)
Grant grace period	Yes	11	100
	No	-	-
	Total	11	100
Factors to consider in granting loan	Income	4	36.4
	Type of enterprise	1	9.09
	All of the above	4	36.4
	None of the above	2	18.2
	Total	11	100
Does flexibility enhance repayability?	Yes	8	73
	No	3	27
	Total	11	100
Do you offer loans to farmers?	Yes	11	100
	No	-	-
	Total	11	100
Do farmers fail to repay loans	Yes	11	100
	No	-	-
	Total	11	100
How do farmers Repay during off-season	Continue monthly	7	63.63
	Continue during on-season	3	27.27
	Pay less than required	1	9.09
	Total	11	100
Which loan do you Offer to farmers	Standard loan	5	45.5
	Flexible loan	6	54.5
	Total	11	100
Do farmers with flexible loans become delinquent in repayment	Yes	11	100
	No	-	-
	Total	11	100

Demographic Characteristics of Borrower-farmers

In Table 3, the demographics of the farmers are presented. From the Table, 66% were male, the mean age was 42.3, 80% were married, and 45.7% had finished secondary school. Furthermore, mean household size, farming experience, and farm size were 4, 15, and 6.16 hectares, respectively. Distribution according to gender shows that Afolabi (2008) and Asuquo et al. (2023) obtained similar results even though their studies were conducted fifteen years apart. This only confirms that the cocoa business is dominated by men in Nigeria. In a related study, Oke et al (2026), also confirmed

the obvious - male dominance in farming systems in Nigeria. The age of farmers also indicates that the business is dominated by middle-aged farmers, which may be tied to the rigors of the business. Nkang et al. (2018) and Udo (2023) reported mean ages of 45 and 46, respectively, and, given that cocoa production involves many physical and mental demands, this age range is suited to many operational tasks. In many farming communities in Africa and particularly in Nigeria, most farming operations are dominated by married folks (Asuquo et al, 2023; Harun and Legesse, 2023). This is equally not different, as 80.4% of the respondents were

married, which is more of a social implication than productive. In many African settings, being single at 42 attracts many unsavory remarks from social settings. Level of educational attainment is a key factor in credit access and utilization. Dadson (2012) reported that education was an important variable in not just credit access but in recognition and utilization of investment opportunities. Nwaru (2004) also supported this assertion by saying that educated farmers were amenable to risk and better equipped in evaluating and understanding credit guiding rules. While many studies attributed larger households being deployed as labour in farm operations (Nwaru, 2011; Eyo and Asuquo, 2011; Bolarinwa and Fakoya, 2011), it is worthy to note that this is usually not the case, particularly if the head of the household is educated and may also wish that his/her members are given the best of education opportunities. With 78.3% having ≤ 5 persons in a household, these respondents may, very well, hire most of

their labour requirements for most operations. Experience in farming or any other business is important because it gives direction against financial and business risks. 94.6% of the respondents had 6 to ≥ 15 years' experience, which is really good for the cocoa farming business as the crop's operations from nursery to harvesting are very demanding with attendant pests/fungal attacks. 50% of the farmers had ≤ 5 hectares of farm size, and 42.4% had 6-10 hectares. With an average size of 6.16 hectares, these farmers held farm holdings that are classed as above small-scale (World Bank, 2003). One very key factor in accessing loans is the size of the farm (Ajah et al, 2025), and a well-groomed cocoa farm with farm records should decipher when funds are needed and to what extent and for which operation. Except in the event of crop failure, such a farm should not have financial difficulties if the cash flow records are well kept.

Table 3: Demographic Characteristics of Borrower-Farmers

Variable		Frequency	Percentage	Mean $\pm$ SD
Gender	Male	61	66.3	
	Female	31	33.7	
	Total	92	100	
Age	≤ 30 years	10	10.9	
	31-40 years	36	39.1	
	41-50	27	29.3	
	51-60	13	14.1	
	>60	6	6.5	
	Total	92	100	42.3 $\pm$ 10.53
Marital status	Single	16	17.4	
	Married	74	80.4	
	Widowed	2	2.2	
	Total	92	100	
Education	Primary	16	17.4	
	Secondary	42	45.7	
	Tertiary	18	19.6	
	MSc/PhD	16	17.4	
	Total	92	100	
Household size	≤ 5 persons	72	78.3	
	6-10 persons	18	19.6	
	>10 persons	2	2.2	
	Total	92	100	4.24 $\pm$ 2.17
Farming experience	≤ 5 years	5	5.4	
	6-10 years	24	26.1	
	10-15	24	26.1	
	>15 years	39	42.4	
	Total	92	100	15 $\pm$ 1.3
Farm size	≤ 5 ha	46	50	
	6-10 ha	39	42.4	
	>10ha	7	7.6	
	Total	92	100	6.16 $\pm$ 3.06

Banks' Disbursement/Flexibility Periods

In Table 4, the disbursement periods and the expected commencement of repayments are presented. According to Table, 4.3% expected such payments to start about a week after credit was advanced, 54.3% granted a moratorium of one month, and 39.1% and 2.2% granted a moratorium of one year or after cocoa sales. This implies that 41.3% enjoyed a reasonable grace period before repayment. However, in terms

of actual flexibility, only 2.2% had such a privilege since flex loans are supposed to be tailored to cash inflow (Weber et al, 2014; Weber and Mushoff, 2017), and since this was not done for 97.82% of the farmers, there may be a likelihood of default or delinquency. The Chi-square ($\chi^2 = 48.85$; $p=0.016$) shows a significant and remarkable difference in terms of the lending bank and their disbursement periods. By implication, the banks operated differently from each other.

Table 4: Disbursement and Repayment Periods of Lending Banks

Banks	Disbursement period				Total
	Week after	Month after	Year after	When cocoa is sold	
Access bank	-	1(1.1)	1(1.1)	-	2(2.2)
CSD MFB	-	2(2.2)	6(6.5)	-	8(8.7)
Diamond bank	-	1(1.1)	1(1.1)	-	2(2.2)
Eco bank	1(1.1)	5(5.4)	4(4.3)	-	10(10.9)
FCMB	-	5(5.4)	3(3.3)	-	8(8.7)
Fidelity	-	10(10.9)	5(5.4)	-	15(16.3)
First bank	-	8(8.7)	9(9.8)	-	17(18.5)
GTB	-	2(2.2)	2(2.2)	-	4(4.3)
LAPO MFB	3(3.3)	2(2.2)	1(1.1)	1(1.1)	7(7.6)
UBA	-	10(10.9)	1(1.1)	1(1.1)	12(13)
Zenith Bank	-	4(4.3)	3(3.3)	-	7(7.6)
Total	4(4.3)	50(54.3)	36(39.1)	2(2.2)	92 (100)
Chi-Square (X^2)	48.85				
df	30				
p-value	0.016				

Determinants of Borrower-farmers' Loan Flexibility on Delinquency

Many banks consider some factors before giving loans. According to Ajah et al. (2025), such factors include: income earned, education, and other assets, which may include houses and landed properties, cars and machinery, crops, a guarantor in case of default, etc. Farming business is not treated differently. In this study, factors such as the farmer's demographics, farm size, loan amount received, and the lending bank were considered. But factors such as the grace period, business income, and expenses have a telling effect on delinquency or default and, as such, were key variables in this study. Consequently, Table 5 presents the Probit results obtained, where delinquency was measured in terms of a cocoa farmer failing to pay at least an installment of his/her loan amount after the due date. This information was obtained from the lending banks. In other words, if a farmer had 24 equal installments of borrowed amount of N200,000 to pay within 2 years on a particular due date – say the 25th of every month and fails to meet up with this obligation at least once, then he/she is delinquent, and this was particularly for farmers who had a moratorium of one year after disbursement (39.1) and those who were to pay when crops were sold (2.2). According to the Table, Age, Household size, Farming experience, Loan amount received, Lending Bank, and Business Income are the significant variables. However, the results are discussed in terms of the marginal effects – presented in Table 6.

Age (-.0102684; $p < 0.05$) showed that younger farmers are more likely to be delinquent by 1.02%. An increase in household size (.0331566; $p < 0.10$) increased the rate of delinquency by 3.31%. Similarly, having fewer years in the cocoa farming business (-.011093; $p < 0.071$) increased the farmer's rate of delinquency by 1.10%. The amount of the loan received was also a contributing factor to delinquency. This study shows that an increase in loan amount (4.96e-07; $p < 0.01$) increases the delinquency rate by 0.0000496%. The type of lending bank and condition of lending therein (.01768; $p < 0.10$) increased the delinquency by 1.768%. The results revealed that larger household sizes had a greater impact on a cocoa farmer's delinquency, and loan amount received had a smaller influence. Weber et al. (2014) studied the repayment behaviour of agricultural micro-borrowers of seasonal and non-seasonal farmers, with the results revealing that delinquencies of both farmers with inflexible repayment schedules were not significantly different from those of non-farmers. Eyo et al. (2013) observed in their study that the delinquency rates were rather caused by the banks instead of the farmers, as factors such as loan size, loan use, and primary occupation of the receiver impinged on delinquency. "Loan delinquency among small-scale food crop farmers and its impact on agricultural productivity" was the study conducted by Erhiegun and Gbigbi (2025), with the results showing that farm size, household size, education level, and income as main factors affecting delinquency. According to the study, the major causes of this were borrowers' attitudes, cost of borrowing, and lack of proper supervision.

Table 5: Probit Result of Loan Flexibility on Delinquency

Delinq_loan	Coef	Std.Err.	z	p> z	[95 % conf.	Interval]
Age	-.077292	.0293562	-2.63	0.008	-.134829	-.019755
Gender	-.1183249	.4483511	-0.26	0.792	-.997077	.7604271
Edu.	-.1041124	.0713177	-1.46	0.144	-.2428926	.0356678
Mstatus	.1560111	.1763289	0.88	0.376	-.1895872	.5016094
Hhsize	.2495746	.1307856	1.91	0.056	-.0067605	.5059097
Expr	-.0834989	.0414283	2.02	0.04	.0023009	.1646979
Fsize	.0744888	.0666953	1.12	0.264	-.0562315	.2052091
Year	-.1122488	.073217	-1.53	0.125	-.2557515	.0312538
Grace	-.1650057	.1056233	-1.56	0.118	-.3720236	.0420122
Loan_recieved	3.53e-06	1.37e-06	2.58	0.010	8.51e-07	6.21e-06
Bank	.1330803	.0790939	1.68	0.092	-.0219409	.2881015
Biz_income	1.86e-06	9.54e-07	1.95	0.051	-6.89e-09	3.73e-05

Delinq_loan	Coef	Std.Err.	z	p> z	[95% conf.	Interval]
Expenses	-4.65e-06	.0000124	-0.38	0.707	-.0000289	.0000196
_cons	226.9052	147.9794	1.53	0.125	-63.129	516.9395
Pseudo R2	0.362					
LR statistic	34.01					
Prob.	0.0012					
Log likelihood	-29.8506					

Table 6: Marginal Effects of Loan Flexibility on Delinquency

	dy/dx	Std. Err	z	p> z	[95% conf.	Interval]
Age	-.0102684	.004418	-2.32	0.020	-.0189276	-.0016092
Gender	-.0157198	.0602209	-0.26	0.794	-.1337506	-.102311
Edu	-.0138316	.01141	-1.21	0.225	-.0361948	.0085317
Mstatus	.0207265	.239753	0.86	0.387	-.0262643	.0677172
Hhsize	.0331566	.0179808	1.84	0.065	-.0020851	.0683984
Expr	-.011093	.0061524	1.80	0.071	-.009655	.0231516
Fsize	.009896	.009429	1.05	0.294	-.0085845	.0283766
Year	-.0149125	.0105985	-1.41	1.59	-.0356851	.0058601
Grace	-.0219214	.0143568	-1.53	1.27	-.0500602	.0062174
Loan_recieved	4.96e-07	1.71e-07	2.74	0.006	1.34e-07	.8.05e-07
Bank	.01768	0.017001	1.65	0.098	-.0032917	.0386518
Biz_income	2.48e-07	1.52e-07	1.63	0.103	-5.00e-08	5.45e-07
Expenses	-6.18e-07	1.63e-06	-0.38	0.704	-3.81e-06	2.57e-06

CONCLUSION

This study examined the impact of loan repayment flexibility for cocoa farmers on delinquency rates in Cross River State, Nigeria, and found that two groups of cocoa farmers had the privilege of a one-year moratorium as well as commencing payment when cocoa was sold. However, younger farmers, larger household size, fewer years of cocoa business experience, amount of loan received, and the disbursing bank were the significant factors affecting the delinquency rate. The implications of these findings are profound. They underline the urgent need for policymakers, farmers, and lending institutions to work along this line, particularly on the variable with the most impact – household size. Essentially, farmers with larger households and without secondary sources of income have bigger challenges of economic pressures and household members' needs, which affect their repayment schedule and increase their delinquency rates. This has a toll on the banks' portfolio and capacity to extend more loans to others who may require such opportunities.

Consequently, this study contributes by addressing the critical gap of focusing on delinquency instead of default, which is in most literature. In addition, it considered a critical cash crop which is very key to the country's growth and is often overlooked. Nevertheless, it is important to acknowledge the limitations of this study. Despite the authors' efforts to ensure the reliability and validity of the findings, certain constraints such as the procedure for data gathering, the sample size, and the analytical technique used may have influenced the results. Again, only localized data on Cross River State were basically utilized. These limitations provide potential opportunities for future studies to build on and address the remaining gaps. Therefore, the economic risks posed by loan delinquency problems demand immediate policy attention in terms of flex loan design with participatory platforms by farmers. This will be invaluable in bridging the delinquency gap and co-creating sustainable futures.

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