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From The Income Statement Analysis to The Suitability of Microfinance Institutions Interest Rates: Case of Maize Production in Northern Benin

KEYWORDS: Economic analysis, income statement, Credit interest rate, Maize Production, Benin

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ABSTRACT *This study analyses the suitability of interest rates charged by microfinance institutions and the profitability of maize production in northern Benin. To do so, the income statement was established. Then, the average return to capital was used as an indicator of profitability to examine the possibility for farmers to get loans at given interest rates and to be able to pay back these loans and the related interests. The case study was conducted in the municipalities of Banikoara and Bembèrèkè in Northern Benin. A total of 167 maize producers was selected through random sampling techniques, and investigated on the basis of a questionnaire. The data analysis revealed that the interests paid on loans represent about 7% of the total production costs for per hectare of maize. In addition, maize production was found to be a profitable activity because it provides a good remuneration of theinvested capital. The average return to capital was indeed statistically higher that the current interest rates charged by microfinance institutions mainly represented by the Local Bank of Mutual Agricultural Credit (CLCAM) and the Association for the Promotion and Development Support of the Micro-enterprises (PADME).*

1. INTRODUCTION

The investment is widely recognized as a prerequisite for the conduct and the sustainability of any economic activity. In agriculture, investment is also of paramount importanceas the producers' abilities to mobilize and use capital determinetheir decisions of allocation of the production resources. In this perspective, several studies have shown that the credit constraint affectsnegatively the decisions of producers household(QuisumbingetMcNiven, 2007; Guirkinger et Boucher, 2007). Therefore, access to credit through credible microfinance institutions is seen as an effective intervention tool to support agricultural production.

In most developing countries, access to agricultural financing remains problematic. Indeed, the average rate of use of financial services is only 26% in these countries, far behind the OCDE countries, where it is about 90% (Claessens, 2006). In Benin, the granting of formal agricultural credit is provided by various microfinance institutions of which, the most represented are the Local Bankof Mutual Agricultural (CLCAM) and the Associations for the Promotion and Development Support of Micro Enterprise (PADME). However, several studies have estimated at less than 20%, the rate of access to or use of agricultural credit (Yabi et al, 2012a; Yabi et al, 2012b;Paraïso et al, 2012a;Yegbemey et al. , 2012). The high interest rate of agricultural credit is often seen as a limited factor for the producers' access to credit. Therefore, the issue of the balance between the interest rates charged by microfinance institutions and the profitability of agricultural production is a concern.

In Benin, agriculture contributes over 40% to Gross Domestic Product (GDP) and 80% to export earnings (Doligez, 2001). It employs a significant part of the active population, especially in rural areas. Thus, it represents a strategic sector as well, economically as socially. Among the cultivated speculation, maize occupies an important place in Benin agriculture. Indeed, over the past ten years,maize production had a special significance in comparison with cotton, which is remainedduring a long time the main culture. According toYabi et al., (2013), maize in Benin in general and especially in Northern Benin is not only a consumption culture, but also for sale. This leads agricultural credit structures to be interested in the financing ofmaize production. Thus, the profitability of maize production is a very important decision criterion for producers but even more for decision makers. Indeed, for the latter, the support structures of the producers among which are microfinance institutions should work to favour the profitability of production in order to ensure its sustainability. It is in this context that this study looked at the issue of the balance between the interest rates charged by microfinance institutions and the profitability of maize production in Northern Benin.

2. Materials and Methods

2.1 Study Area

The study was conducted in Northern Benin and more specifically in the municipalities of Banikoara and Bembèrèkè (Figure 1). The choice of these two areas was based ontheir great importance inmaize production in Benin in general and in Northern Benin in particular. In each municipality, two villages were selected on the basis ofmaize production and in conjunction with the Regional Agricultural Centerfor Rural Development (CARDER) Borgou-Alibori.

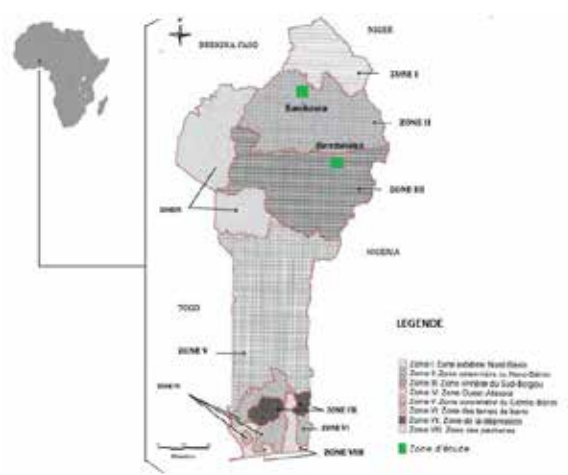

Figure1 :Study Area

Volume : 5 | Issue : 1 | Jan 2015 | ISSN - 2249-555X

2.2 Database

In each selected village, the sampling was conducted in a reasoned and random way. The reasoned sampling has consisted to select only the maize producers. Within these producers, a random sample was then constituted. In doing so, a minimum size of 42 maize producers was selected in each village. Thus a total of 168 maize producers were sampled and investigated. The main collected data were: the socio-economic characteristics (gender, age, level of schooling, experience in agriculture, farm size and access to agricultural credit) and the quantities and prices of inputs involved in maize production during the agricultural campaign 2012-2013 and the output obtained. Data collection was conducted through focus groups and individual interviews. Individual surveys were conducted on the basis of a questionnaire previously established for the data collection. Data analysis was carried out through the use of descriptive statistics (frequencies tables, means and standard deviations) and mean comparison tests (test t of student). The statistical software Stata11 was used for this purpose.

2.3 Analysis Tools

To analyse the profitability of production in terms of access to agricultural credit or not at an interest rate, the average return to capital (TRI) is generally used. Based on the works of Yegbemey (2010), Paraïso et al., (2011), Yabi et al. (2012b) and Paraïso et al., (2012b), the averagereturn to capital (TRI) expresses the net margin per capital used. It is calculated by doing the ratio:

TRI = (MN-MOV) / (CT + MOV)

MN represents the net margin in FCFA / ha, CT total costs in FCFA / ha that do not take into account the value of thehouseholdlabourused and MOV, the total value ofthehouseholdlabourin Man.Day/ha. The value of the household labour is obtained by multiplying the daily price of one day work by the total household labour(MO).

If TRI is higher than the average interest rate of credit in the study zone, the activity is economically profitable. In case the TRI is lower than the average interest rate of credit, the activity is not economically profitable (Paraïso et al., 2012). Under the latter condition, a producer who contracts anagricultural credit with an interest rate i to conduct the production activity in question, cannot pay back the loan and related interest, from the net profit generated by the activity.To obtain the Net Margin, the farm income statement has been previously established. To do this, the table of income Statement (Table 1) was used.

Table1: Exploitation income statement¶

CHARGES			PRODUCTS		
Account Number	Worded	Amount	Account Number	Worded	Amount
	Total 1 :			Total 2 :	
	Result (Profit)				
	Total 3 = Total 4			Total 4 = Total 3	

Source: Established by the author

The income statement established has permitted not only to analyse the cost of maize production, but alsoto calculate the net result of the business. Expressing all expenses and outputof the Income Statement in FCFA / ha, the net income of the activity returns to the Net Margin.

3. RESULTS

3.1 Socio-economic characteristics of the respondents

The analysis of descriptive statistics of some socio-economic data of the respondents indicate that the majority of interviewed farmers was men, with average age of 40 years old and with an average experience of 23 years in agriculture. Education levels and access to credit were low about 37% and 23% respectively. The average farm size was 9 ha.

3.2. Average Income Statement

The Average Income Statement of the agricultural farming (Table 2) showed that the production of one hectare of maize in the study area requires an average investment of 183,840.97 FCFA. The average gross income generated was estimated at 297,103.54 FCFA/ ha. Generally, the purchase of mineral fertilizers (46,591.41 FCFA / ha on average) and the amortization of agricultural machines (35,258.65 FCFA / ha on average) are the most important expenditure items while the cost related to the helpinglabour (895.65 FCFA / ha on average), to the hiring of agricultural equipment (3320 FCFA / ha on average) andto the purchase of seeds (4888.11FCFA/ha on average) were the lower expenditure.

Interested in the source of agricultural activities funding, all producers rely primarily on their own savings or funds. As revealed by the socio-economic characteristics previously presented, access to agricultural credit through microfinance services is still limited. Several reasons could be behind the low observed craze, among which are the interest rates and credit conditions for granting (various procedures). However, producers have acquired loans ranging from 20,000 FCFA to 1000,000 CFA during the agricultural campaign 2012-2013. The interest paid on these loans were estimated to an average of 11532.62 FCFA/ ha or approximately 7% of the total production costs of one hectare of maize. The interest paid were classified as the 6th largest expenditure item after purchasing of mineral fertilizers, depreciation of agricultural equipment, the cost of hired labour, the purchase of small equipment agricultural and the purchase of herbicides.

Tableau 2: Average Income statement of the agricultural campaign 2012-2013

CHARGES			Outcomes		
Account number	Wording	Amount (FCFA/ha)	Account number	Wording	Amount (FCFA/ha)
602	Purchase of seed	4888.11 (± 3487.74)	702	Maize sale	237579.73 (±117795.19)
602	Purchase of mineral fertilizer	46591.41 (±24678.61)	702	Sale of other products	59523.81 (±54544.72)
602	Purchase of organic fertilizer	7093.18 (± 2042.34)			
602	Purchase of herbicide	12334.32 (± 2985.68)			
605	Purchase of small equipment	25232.91 (± 1582.38)			
622	Hiring of land	8260.42 (± 7641.44)			
622	Material hiring	3320 (± 3790.09)			

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CHARGES			Outcomes		
Account number	Wording	Amount (FCFA/ha)	Account number	Wording	Amount (FCFA/ha)
66	Cost of helping labour	895.65 (± 5783.95)			
66	Cost of paid labour	28433.7 (± 42362.64)			
67	Amount paid for interest rate	11532.62 (± 12141.845)			
68	Depre-ciation of material	35258.65 (± 54046.21)			
	TOTAL 1	183840.97 (±122532.01)		TOTAL 2	297103.54 (± 128685.16)
	Outcome (Benefice)	113262.57 (± 107375.57)			
	TOTAL 3	297103.54 (± 128685.16)		TOTAL 4	297103.54 (± 128685.16)

NB: The values in bracket are the standard deviation.
Source: Field data, 2012- 2013

3.3 Average Return to Capital

The result ofTRI calculation is summarized in the table 3.

Table 3: Average Return to Capital

	Minimum	Maximum	Average	Standard Deviation
TRI	-0.81	2.87	0.39	0.64
Test t of Student	TRI threshold = 0.16		About TRI threshold = 0.24	
	t = 4.656 ddl = 166 p = 0.000		t = 3.048 ddl = 166 p = 0.003	

Source: Field data, 2012- 2013

The two main agricultural financing structures are: Local Bank of Mutual Agricultural Credit (CLCAM) and the Association for the Promotion and Development Support of Micro Enterprises (PADME), provide loans with respective interest rate 24% and 16% per year. Considering the interest rates of these two structures, maize production in the study area appears as an economically profitable business regarding the capital investment. Indeed, the average return to capital obtained (0.39) is higher than the average interest rate of 24% and 16%. Moreover, the differences between the average returnto capital obtained from the study and the threshold of the different interest rate in the study areas (0.16 and 0.24) were statistically significant at about 1%. In other words, a producer who takes out a loan for maize production at CLCAM or PADME should be able to pay back the loan and related interest with income generated from production. Furthermore, the average return to capital (TRI) calculated in our study is higher than the average return to capitalfor rice and cotton production estimated respectively at 0.01 in the North-Eastern Benin (yabi et al., 2012b) and -0.155 average in the North-Eastern Benin estimated by (Paraïso et al., 2012a). These results suggest that maize production is economically more profitable regardingthe capital investment.

4. CONCLUSION

The analysis of the income statement for maize production in the municipalities of Banikoara and Bembèrèkè in northern Benin has highlighted farmer's limited access to agricultural credit. However, the interest paid on loans represents only 7% of total production costs of one hectare of maize. The estimation of the average return to capital(TRI) also found that maize production in the study area is economically profitable, encouraging thereby producers to increase their funding capacity through agricultural credit from available microfinance institutions. Because of the interest rates currently applied seem to favour good profitability of maize production, credit granting conditions are the factors to consider for better understandingof the poor access to credit. Finally, it should be noted that this simulation based on the assumption that the entire produced quantity is marketed. Otherwise, the results might be different even contradictory, hence the importance of the structures ofcereal products such as the National Food Security Office (ONASA), which is in charge of buying in order to resell them on the market.

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