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# Loan Pricing of Nigerian Microfinance Banks: Survey & Methods of Assessment

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**Acronyms**

| | |
|---|---|
| AE | Administrative Expense Ratio |
| APR | Annual Percentage Rate |
| CAP | Capitalization |
| CBN | Central Bank of Nigeria |
| CF | Cost of Funds Rate |
| EIR | Effective Interest Rate |
| FSS2020 | Financial System Strategy 2020 |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit |
| IRR | Internal rate of return |
| LL | Loan Loss Rate |
| LtA | Loan to Asset |
| MFB | Microfinance Bank |
| P | Profit Margin |
| PF | Portfolio to assets ratio |
| R | Required yield on loan portfolio |
| RoE | Return on Equity |
| SPM | Social Performance Management |
| TCC | Total Cost of Credit |

**The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH** is a federal enterprise with worldwide operations. The organization supports the German Government in the fields of international cooperation for sustainable development and international education. Through its work, GIZ assists people and societies in shaping their own futures and improving living conditions.

**The GIZ Pro-poor Growth and Employment Promotion in Nigeria (SEDIN) Programme** facilitates key state actors as well as members of the financial and business sectors in effecting reforms of the business and investment climate and to enhance access to financial services for micro, small and medium-sized enterprises in Nigeria. This is in line with Nigeria's national development strategy, the 'Vision 20:2020', and the Financial System Strategy 2020 (FSS 2020). It is divided into three components. One component focuses on financial sector reform by supporting implementation of the FSS 2020, a review of the microfinance policy, regulation and certification of Microfinance Banks, the introduction of micro-insurance, value chain financing, and the strengthening of microfinance banks and their associations in three states (Niger, Plateau and Ogun).

# 1. Introduction

The introduction of the *"Regulatory and Supervisory Guidelines for Microfinance Banks (MFBs) in Nigeria"* of 2005 marked a change in the Nigerian microfinance landscape. Not only did it aim at bringing all financial institutions for low-income earners under a common regulatory framework, it also aimed at fostering a stronger profit and market orientation of the sector. At the same time, the regulatory body, Central Bank of Nigeria (CBN), mandates microfinance banks (MFBs) for poverty alleviation. These different overarching goals of operating financially sustainable and profitably on the one hand, while fostering social inclusion and alleviating poverty on the other is usually referred to as the double-bottom line of MFBs.

This double-bottom line has several ramifications for the process of pricing microloan products: for one, prices for microloans must be high enough to ensure reasonable returns for the MFB; it is obvious that some markup must be charged on loans in order to reflect the risks associated with low-income borrowers and the lack of collateral.[1] At the same time, high prices of loans can compromise the objective of alleviating poverty, if they are excessive and actually drive more people into poverty.[2] Moreover, low-income earners usually are less financially literate and thus can be more easily burdened with hidden costs. Finding "the right price" for microloans is thus a balancing act between the MFBs' goals of profit maximization and providing fair conditions to low-income clientele.

In Nigeria, there seems to be a general perception that the interest rates on microloans are very high. This is important as responsible pricing is a core determinant of the sectors' sustainability, growth and outreach. Yet there is virtually no knowledge on how expensive loans really are throughout the country and which factors are responsible for the charges.[3] However, even if such data were available, measures must be found to analyze the drivers for the costs imposed and moreover it must be assessed whether such pricing strategies are responsible and sustainable.

This paper thus pursues several objectives: The first objective is to take stock of microloan products offered in Nigeria and to assess how different loan designs compare in terms of all-in effective cost. The second objective is to develop a better understanding of the factors that determine loan prices in Nigeria, i.e. whether it is loan features or internal cost structures of MFBs that drive the pricing outcome. The third objective is to assess core cost drivers of Nigerian MFBs that affect most strongly the required yield of an institution. The final and most important objective is to analyze whether the rates charged are rational and

1 For the arguments focusing on the necessity to charge high prices, see e.g. Ledgerwood (1998): "Microfinance Handbook – An Institutional and Financial Perspective" p.18-19; Robinson (1994): "Savings Mobilization and Microenterprise Finance; The Indonesian Experience".

2 For the arguments focusing on the negative effects of high prices on low-income earners, see e.g. Protisch (2007): "The role of Interest Rates in Microfinance: Why they are so high and how they affect consumer behavior." p.4.

3 E.g. admitted by P. N. Eluhaiwe (Director of Development Finance Department, CBN) during the CBN's 7th Annual MSMEs Finance Conference & D-8 Workshop on Microfinance for SMEs (Session on Financial Inclusion, 2013, August, 16th).

sustainable for MFBs and by doing so, contribute to the global conversation about responsible pricing in microfinance.

To achieve these objectives the paper assesses two samples. The first sample explores 71 loan products of 21 MFBs operating in Niger, Ogun and Plateau states. All but one of these MFBs are small, Unit MFBs with capital bases of between NGN 20 & 100 million; operating within a single local government area. This sample provides a rough reflection of the 765 (out of 856) Unit MFBs operating in the country.[4] The second sample looks at 20 loan products for 7 of the 15 largest MFBs in the country. This group of 15 MFBs is responsible for approximately 70% of the sectors total assets under management and operate on either the national or state level.

This paper is structured as follows. First, the paper provides an explanation of the rationale for this report (Section 1.1) and the methodology applied (Section 1.2). The report then explores the two samples separately. Chapter 2 looks at Sample 1 and is divided into an explanation of Sample 1 product features (Section 2.1) and the findings of the analysis of standardized loan prices (Section 2.2). Chapter 3 is ordered in the same manner to assess Sample 2. The chapter provides a comparison of Sample 1 & 2 findings while exploring in greater detail the core drivers of MFBs' required yield. Chapter 4 brings together standardized calculation of loan prices of both Sample 1 and 2 in order to compare interest rates in Nigeria to other African countries. Chapter 5 concludes the report.

## 1.1. Background

SEDIN facilitated two subsequent loan pricing surveys of different samples, Sample 1 & 2 in order to be able to assess quantitatively the common claim that interest rate charged by Nigerian MFBs are comparatively high.

The first survey (Sample 1) was conducted in 2013. MFBs in the three SEDIN partner states of Niger, Ogun and Plateau were selected to take part. In early-2014 the final results of Sample 1 were presented and discussed with OFISD (Other Financial Institution Supervisory Department) of CBN as well as managing directors of selected SEDIN partner MFBs. OFISD confirmed the importance of the findings and indicated interest in further discussion. However, the MFBs in Plateau and Niger State were more resistant to the findings. Feedback suggested general skepticism towards the results and the findings of high interest rate charges were attributed by partner MFBs to cost drivers that were according to them beyond their control.

In June 2014, SEDIN also presented the findings of Sample 1 to the Nigerian Microfinance Platform, a discussion platform that includes the 15 largest MFBs in Nigeria. The findings were again met with resistance. Some argued that the sample was not representative of the

4 Figures shared by the Central Bank of Nigeria at the National Association of Microfinance Banks (NAMB) Unified IT Platform Discussion. January 2015.

entire sector because the first sample only assessed small MFBs (Unit MFBs) and not larger, state and national institutions that are members of the Platform. SEDIN then agreed to conduct a second assessment of the largest MFBs in the country. Members of the Platform agreed to share their loan product features and cost structure to allow SEDIN to conduct an additional loan pricing survey in order to decompose and analyze the cost drivers of sampled MFBs. Part 3 of the report explores the findings of Sample 2 while comparing them with Sample 1. The goal of this exercise was to assess whether the 'uncontrollable factors' discussed at the Platform meetings were in fact the core drivers of the interest rates MFBs charge on their loans; this was not possible with the first sample due to the lower quality of data. For reasons of clarity, both samples are hence separated in this report. The results of Sample 2 were presented to the Nigeria Microfinance Platform in September 2014. Again, the presentation generated a somewhat heated debate on what are the real and unavoidable cost drivers not captured in the survey, but hidden under overheads. The Platform has not yet agreed on common actions it could take to improve on responsible pricing.

## 1.2. Methodology

In order to calculate standardized costs, the loans were assessed using the Annual Percentage Rate (APR). Sample 1 data was gathered based on a questionnaire consisting of 25 questions about the MFBs' most common loan products. Besides the necessary information on interest rates, repayment schedule, fees and compulsories, the questionnaire asked for the type of the loan-product, i.e. whether it is a business loan, an agricultural loan or a consumption loan. MFBs were asked to attach a filled-out loan-application sample in order to cross-check the application data against the answered questionnaires and to observe the transparency of price disclosure to clients. The MFBs were finally asked to send their income statements and balance sheets as per the CBN regulatory formats. For Sample 2 the same questionnaire was sent and the same additional documents were requested. Moreover, Sample 2 MFBs were asked to provide detailed financial statements to provide for a more detailed analysis of the MFBs costs.

Following a series of pilot exercises, the questionnaires were disbursed. For Sample 1, 80 MFBs were invited to participate in the survey. 21 completed the questionnaire; amounting to a total of 72 different loan products. Among the 21 MFBs, twelve are from Niger State, five from Ogun State and four from Plateau State. For Sample 2, the 15 largest MFBs members of the Microfinance Platform were invited to share their information. In the end, 7 Platform members shared the information necessary to calculate APR while 5 provided the data needed to calculate required yield and further assess internal cost drivers.

All collected data was analyzed using the MFTransparency toolkit.[5] A detailed explanation of the process used by the toolkit for calculating standardized APRs for different loan products

5 For more information, see: http://www.mftransparency.org/resources/calculating-transparent-pricing-tool/.

is found in Annex II. Readers with no prior experience in standardized measures of loan prices and calculating APRs are strongly encouraged to read the Annex before moving forward. The methods for calculating the internal drivers of APR are explained in the respective sections of the following text.

The main limitations of the survey are related to the quantity and quality of received data. Only a quarter of all contacted MFBs returned a filled-out questionnaire resulting in a rather small sample. Some of the data in the questionnaires was not consistent and could not be used. Only few MFBs attached a filled-out loan form which complicated a proper classification of the loan products. One might be concerned about bias in the survey in as far as the responsive MFBs tend to perform better in terms of responsible pricing, while the ones who are aware of their irresponsible pricing decided not to answer. However, our results do not seem to support this suspected bias.

# 2. Sample 1

## 2.1. Sample 1 Product Features

Table 1 shows the distribution of different types of loans in the sample:

| | Agricultural | Business | Consumption | Unspecified | Total |
|---|---|---|---|---|---|
| Niger | 11 (15%) | 17 (24%) | 12 (17%) | 3 (4%) | 43 (60%) |
| Ogun | 1 (1%) | 8 (11%) | 2 (3%) | 8 (11%) | 19 (26%) |
| Plateau | 0 | 2 (3%) | 3 (4%) | 5 (7%) | 10 (14%) |
| All | 12 (17%) | 27 (38%) | 17 (24%) | 16 (22%) | 72 (100%) |

**Table 1: Distribution of loan types in the sample**

Business loans were the most frequently reported loan product (38%), followed by consumption (24%) and unspecified loans (22%). Agricultural loans have a share of 17% of reported loan products.

Several issues are crucial to understanding the data on loan purpose: First, the distribution covers the loan products **offered** only. The table does not hold any information on how many loans of each category are actually **requested** and/or **disbursed**. Secondly, the classification of loans according to their purpose was not based on the actual investment undertaken but on a classification by the MFBs who were asked to categorize their products along this typology. As a consequence, the actual loan use does not always match the loan's designated purpose. Thirdly, unspecified loans can be used for all forms of investments **including** agricultural and business investment, as well as consumption.

The following tables show further information on the ranges and averages of the loan amount and maturity.

| | Agricultural | Business | Consumption | Unspecified |
|---|---|---|---|---|
| Niger | 20,000 - 250,000 | 10,000 - 400,000 | 10,000 - 80,000 | 500,000 |
| Ogun | 50,000 | 29,000 - 1,000,000 | 50,000 | 10,000 - 20,000 |
| Plateau | | 50,000 - 100,000 | 20,000 - 300,000 | 150,000 - 500,000 |
| All | 20,000 - 250,000 | 10,000 - 1,000,000 | 10,000 - 300,000 | 10,000 - 500,000 |
| Average loan amount | 68,000; without group loans 52,000 | 122,000 | 64,000 | 248,000 |

**Table 2: Average loan amounts in sample in NGN**

| | Agricultural | Business | Consumption | Unspecified loans |
|---|---|---|---|---|
| Niger | 90 days - 6 months | 1 - 6 months | 1 - 6 months | 3 months |
| Ogun | 4 months | 1 - 6 months | 3 months | 30 days - 10 months |
| Plateau | - | 4 months | 4 - 6 months | 5 - 6 months |
| All | 90 days - 6 months | 1 - 6 months | 1 - 6 months | 30 days - 6 months |

**Table 3: Average loan tenor in sample**

The monthly nominal interest rate stated by the MFBs differs between all loan products in a large range from 1.75% to 9% (see Annex I, table 12). The monthly nominal interest rate for agricultural loans ranges from 2.5% to 5%, for business loans from 1.75% to 9%, for consumption loans from 2.5% to 7.5% and for unspecified loans from 2.5% to 6%. The share between interest charged on a flat and a declining balance is very balanced. 51% of the loan products are charged on a declining balance basis and 49% on a flat basis. Nevertheless, these figures differ between the three states. While a slight majority of the loan products in Niger and Ogun State is charged on a declining balance (59% in Niger and 53% in Ogun), 78% of all loan products in Plateau State are charged on a flat basis. One would expect nominal interest rates on a flat basis to be clearly lower than rates quoted for declining balance calculation, but the data shows that the nominal interest rates charged on a flat basis can reach up to 6% per month[6].

For almost all loan products – 71 out of the 72 – fees and commissions are due. They range between one and ten percent of the loan amount. Some MFBs additionally charge a fee as a

6 For this loan product a monthly nominal interest rate charged on a flat basis results in an APR of 152.3%.

fixed amount in the range of NGN 200 to 1,500 e.g. for obtaining a loan application form. The most common fees are administration fees, application fees, monitoring fees and risk premium fees and commissions. Some extraordinary fees such as stamp duty can also be found. Especially for small loan amounts, the high fees and commissions significantly increase the effective rate of the loan.

For the majority of the loan products (64%), compulsory savings apply. The compulsory savings requirements range between 5% and 30% of the loan amount. In this respect, the data show large differences between the three states and between the different loan products. While compulsory savings apply to 79% of all loan products in Niger State, this is the case for only 32% of loan products in Ogun State. In Plateau State, 7 of 10 loan products require compulsory savings. Only one third of the MFBs pay interest on these compulsory savings. The interest ranges from one to three percent per annum.[7]

Regarding the different loan products, the data shows that agricultural loans and business loans have comparatively higher shares of loans with required savings (71% and 70%). It has to be kept in mind, that 90% of the agricultural loan products are from Niger State where the majority of loans require compulsory savings. Consumption and unspecified loan products are more or less balanced concerning compulsory savings with 53% and 50% respectively.

The last cost factor of loans is the repayment structure, i.e. the installment frequency and interest invoicing interval. Overall, 54% of all loan products have to be repaid in equal monthly installments of principal and interest. Other payment profiles include single bullet repayments (7%), weekly (21%) and daily (7%) installments.[8] The short maturity of most products (around 30 days to six months) indicates that microloans are designed to be used for emergency situations or “buy-and-sell” clients who need the loan to engage in trade. The repayment structure is similar for consumption, business and unspecified loan products. However, there seems to be a differentiation for agricultural loans. Their minimum maturity is 90 days. Furthermore, they stand out concerning their repayment frequencies. 42% of all agricultural loans are settled either in a single bullet payment of both principal and interest or in a principal bullet redemption with monthly interest installments. This cash flow profile is more suitable for investing in farm inputs.

7 For an overview about the compulsory savings, see Annex I, table 12.

8 The remaining small percentage comprises of repayments each 4 weeks, 2 weeks and 15 days (in sum: 6% of all loans). Moreover some few loans use combinations where principal payments and interest payments do not follow the same schedule (e.g. monthly repayment of principal and single-end term payment of interest; in sum: 6% of all loans).

## 2.2. Presentation of Results

### APRs of Sample 1 MFBs at a glance

The APRs of loans in the sample range high in absolute terms with an average of 127% and a median of 102%. The median as the value which separates the upper half of the data sample from the lower half. The median is more indicative of the "typical" APR than the average, because the APRs differ widely and several outliers can be found (see figure 1, 2 & 5). In fact the spread between the cheapest and the most expensive loans is 299 percentage points. The cheapest loan can be found in Ogun State and has an APR of 38.4%. The most expensive loan can be found in Niger State and has an APR of 337.4%.

| Median | Average | Minimum | Maximum | Spread |
|---|---|---|---|---|
| 102% | 127% | 38% | 337% | 299% |

**Table 4: Descriptive statistical data on APRs**

The cheapest loan product found (in standardized APRs measures) is an "unspecified" loan. It is used for emergency, housing, trading, servicing, farming, inventory and tools. Its average loan amount is NGN 50,000 and the loan has a very long average maturity of ten months, which is unusual for microloans in Nigeria. It is repaid on a monthly basis. The nominal monthly interest rate is 2.1% charged on a declining balance. The loan comes without compulsory savings. Additionally 5% of the loan amount plus NGN 250 is charged as fees. This results in an APR of 38.4% for a NGN 50,000 loan.

The three most expensive loan products in the sample are all from the same MFB. They are all designed similarly even though they are earmarked for different purposes: One is declared as an agricultural loan, one as a business loan and one as a consumption loan. These loans are disbursed at an average loan amount of NGN 50,000 according to the MFB and the repayment frequency is in equal weekly installments of principal and interest over a loan tenor of 3 months. The monthly nominal interest rate is 5% on a flat basis. The loans require a compulsory saving of 25% of the initial loan amount. 3% interest per annum is paid on the savings. Additionally fees and commission of 7% (1% administration fee, 4% commission fee, 2% risk premium fee) of the loan amount plus NGN 1,500 (NGN 500 application fee and NGN 1,000 monitoring fee) become due. This results in an APR of 337.4%.

This example already indicates that some MFBs do not necessarily design their loan products according to their clients' needs. Offering the same loan product for different purposes indicates that the loan is not designed to match the economic activity of the clients.

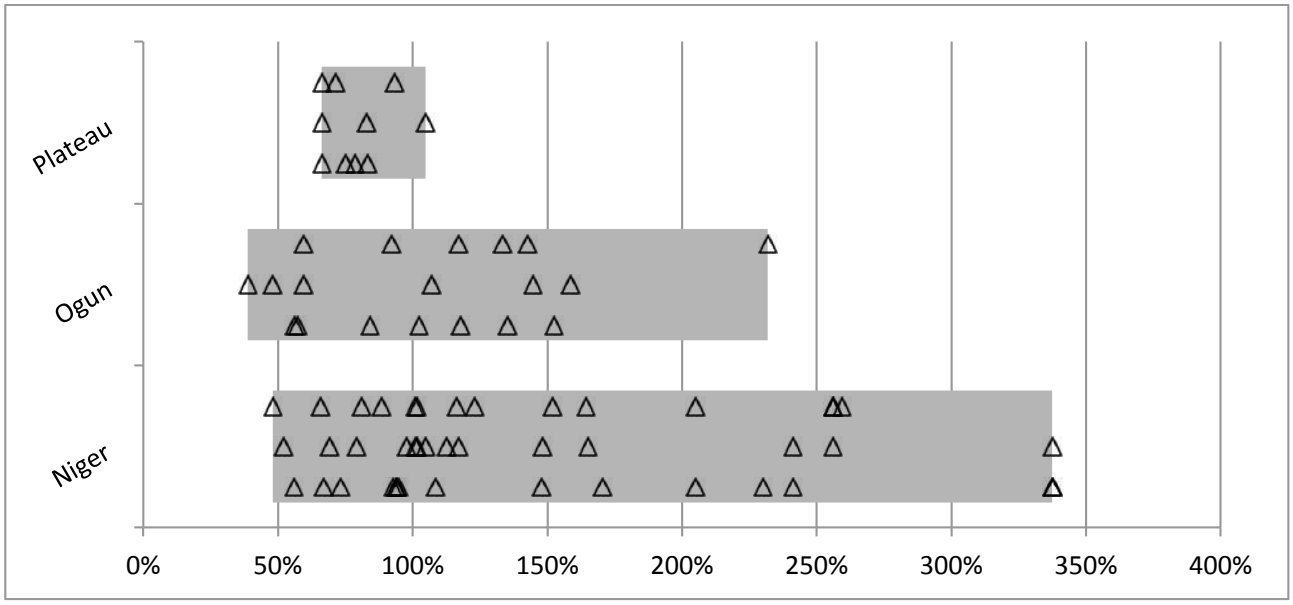


**Figure 1: Range of APRs per state**

The widest spread of APRs can be found in Niger State (see Figure 1). The APR ranges from 48.2% to 337.4% while the APR in Ogun State ranges from 38.3% to 231.7%. It is interesting to note that both the highest and lowest loan price in Ogun State come from the same MFB. The smallest spread of APRs is found in Plateau State. The APR ranges from 66.1% to 104.9%. The triangles in the graph symbolize the respective APR of the loan products while the grey area represents the spread of the observations. The triangles indicate that the highest accumulation of APRs is in the range of 80% to 120% in Niger State. A second accumulation of APRs occurs in Niger and Ogun State between 140% and 175%. In contrast to Plateau and Ogun State, more loans in Niger State have an APR of above 200%.

The large spread indicates that there is limited competition in the Nigerian microfinance sector. The situation seems to be somewhat better in Plateau State. However, the fact that all observations from Plateau come from only four MFBs does not allow a generalization of this observation, since the APRs of different loans within one MFB correlate strongly.

## APRs and product features

In the following, we will analyze whether certain features of the loan product can account for the high APR and/or the wide spread of the different APRs. Specifically we will look at the relationships between APR and loan tenor, loan amount and loan purpose respectively.

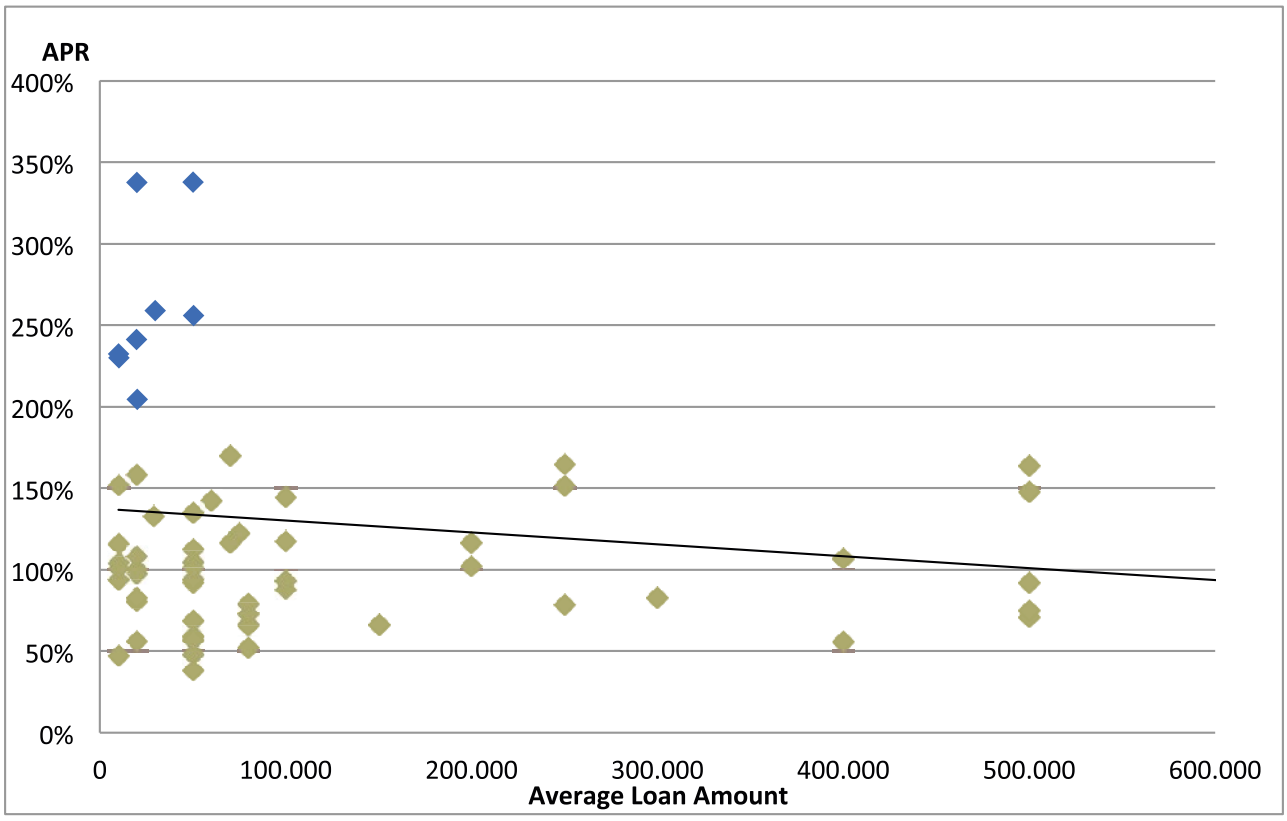


**Figure 2: APRs & loan amount (NGN)**[9]

In line with the observations about the competitiveness of pricing, we neither find a strong correlation between APRs and loan amounts nor between APRs and loan tenor. In a strongly competitive market, one would expect the costs for loans to drop with higher loan amounts and longer tenors. The reason for this are the high transaction costs of micro lending compared to traditional commercial lending. In microcredit, the cost structure is dominated by fixed unit costs. In terms of operating expenses, it costs almost as much to make a $ 100 loan as it does to make a $ 1,000 loan. At the same time, income rises proportionally with the loan size, as it is generated as a percentage of the loan amount. Thus, in competitive markets, the APR should decline with increasing loan amounts. A similar relationship should exist with respect to the loan tenor. All else equal, loans with a longer maturity should have lower APRs because the fixed unit cost of originating the loan can be recovered over a longer interest-earning loan period.

In line with the observations above, we find no evidence of strongly competitive pricing, when looking at the relationships between APR and loan amount or tenor (see Figures 2 & 3). Figure 2 indicates a weak negative correlation between loan amount and APR. However, especially within the range of most frequently used loan amounts up to NGN 100,000, no clear pattern can be found. In fact the downward slope of the trend-line seems to stem from the fact that there are no extreme APR values for high loan amounts. At the same time, the

9 One observation of loan with an APR of 84% at a loan amount of NGN 1 million was dropped from the graph for reasons of scaling.

cheapest options are found for smaller loan amounts which contradicts theory. It is thus the high rate outliers in the small loan segment (marked in blue) that determine the slope of the regression line.

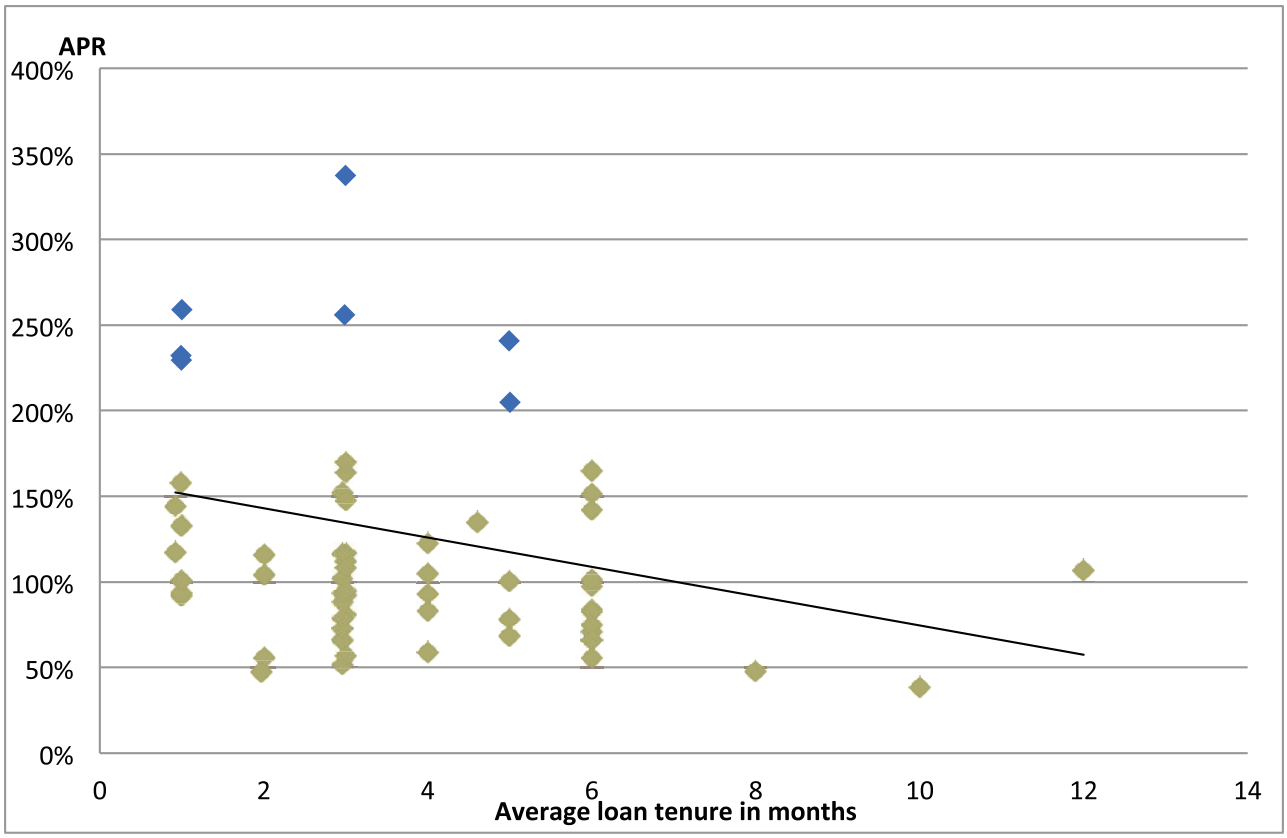


**Figure 3: APRs & loan tenor (month)**

The relationship between APR and loan tenor shows a slightly stronger downward sloping regression line. Again, this effect mostly appears to be the result of the overall larger number of observations for short tenors including a number of high rate outliers. However, low APRs can be found for all tenors such that the extreme observations for shorter maturities (marked in blue) dominate the downward trend.

It must be stressed that even in competitive microcredit markets, a strong downward slope would not necessarily be expected, as the range of observed loan tenors rarely exceeds 12 months. In essence, this means that the large spread of APRs in Nigeria can neither be meaningfully attributed to the tenor nor to the size of the loan.

We will now turn to the question whether the loan purpose might explain some of the wide ranges of observed APRs. Figure 4 shows the distribution of APRs per different loan types (agricultural, business, consumption and unspecified). The rationale behind this exercise is to assess whether earmarking is responsible for the spread of the APR. It could be the case that APRs differ strongly along the lines of loan purpose because different fields of investment have very different risk-profiles. Alternatively, in markets with low competition it could be the case that MFBs try to match customers' repayment abilities thus seeking a larger part of

the customer's rent instead of offering the lowest possible price. The findings, however, do not suggest that different risk-profiles or the customer's repayment ability is a driving force for MFBs' pricing decisions.

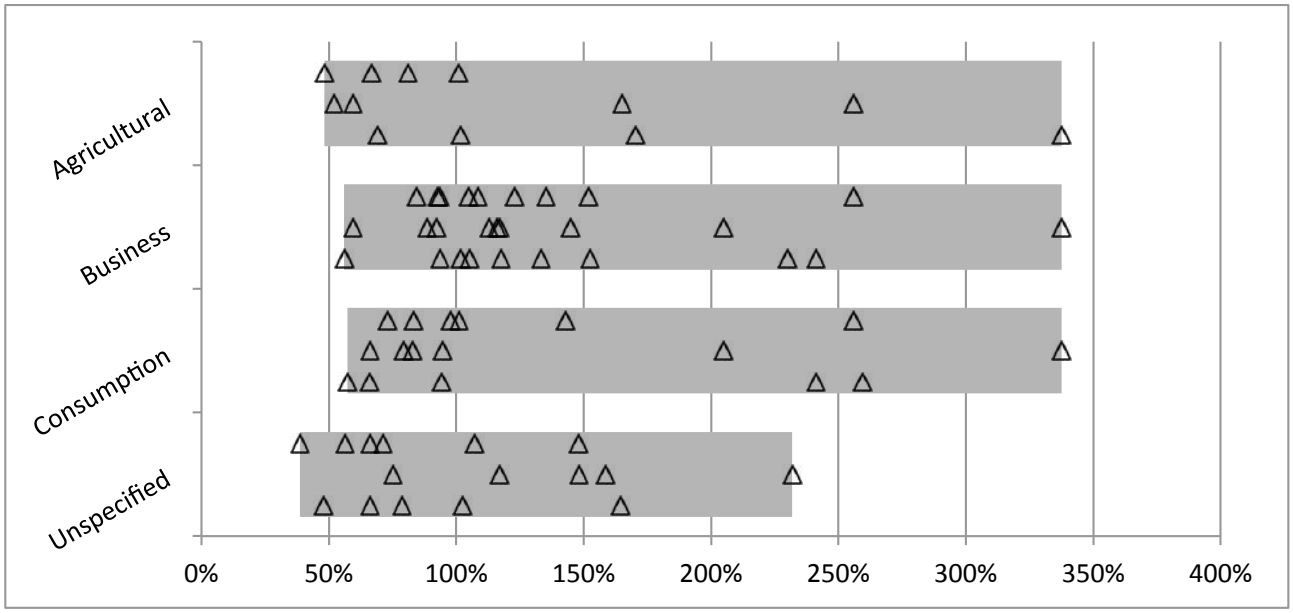


**Figure 4: Range of APR per product, authors' calculations**

In fact, the data show some variation of the prices with regards to the loan purpose. When disregarding the single outliers with extremely high rates, we can get an intuitive sense from the clustering of the APR observations in Figure 4 that business loans are the most expensive, while agricultural, consumption and unspecified are cheaper on average, with the lowest rates observed overall coming from agricultural and unspecified loans.

Concerning business loans there was no straightforward expectation. On the one hand, one might have expected APRs on business loans to come out relatively lower than for agricultural and consumer lending. The reason being that business loans are typically the most visible, high-volume product where pricing should be the most competitive. On the other hand, investments into business usually generate the highest economic returns, depending on their specific usage. The data on the specific usage of business loans supports that they are used for activities that generate comparatively high economic returns: More than half of the business loans in the sample are specified to be used for (different combinations of) trading, working capital, inventory and supplies, all of which tend to generate comparatively high margins in micro and small enterprises. It could be the case that high charges for business loans are the result of high projected returns. However, no clear answer can be given since the average APRs for the different product categories do not deviate very strongly and the sample size is limited.

The comparatively low rates on agricultural loans are somewhat counter-intuitive. In global microcredit practice and in Nigeria in particular, agricultural loans are perceived as very high

risk due to commonly occurring crop failures. Our expectation therefore would have been higher rather than lower average APRs on agricultural loans. Taking a look at the repayment structures of different loan products suggest that the lower APRs on agricultural loans might simply arise accidentally. While the majority of all products (53%) have to be repaid on a monthly basis, the remaining products mostly use weekly (25%), daily (8%) and quarterly (2%) repayment frequencies (see also "Description of the sample"). However, 60% of all agricultural loan products use a bullet repayment of both principal and interest. This is due to the fact that the money is meant to be repaid after the harvest only which takes a longer time-span. How does this affect the APR? When MFBs apply the same monthly flat interest rate quote to the common bullet repayment profile found in agricultural loans then the APR drops. In other terms: Charging 5% flat interest per month for three months is not equal to charging 15% on a bullet repayment after three months. Looking at the charges of loans with different repayment structures it seems that MFBs do not take this fact into account which might be the reason why loans for "risky business" are on average cheaper.

So far, we explored loan product features and their relationship with APR. No clear patterns emerged that could rationalize the strong divergence of APRs observed across Nigerian MFBs. The slight differentiation according to loan purpose can neither adequately explain the large spreads nor the high absolute level of APRs. Far from practicing fine-tuned, competitive risk-adjusted pricing strategies, it appears then that MFBs charge according to "rules of thumb" rather than precise APR calculations.

## MFB-internal drivers of APR

We will now move on from analyzing particular loan features and their relationship with prices to the question whether **internal issues at the MFBs** might actually explain the spread and level of APRs.[10] For such an analysis it has to be clarified which factors from an MFB point of view (should) drive the pricing of loan products. For mere survival of the MFB, the yield on loans must cover the *operating expenses*, the *loan losses* and the *cost of funds*. In order to operate sustainably, the yield should also take into account that equity holders generally demand a real return on their investment in excess of expected inflation levels. Further, a certain *capital growth* must be realized in order to allow for sustainable balance sheet growth and secure debt funding from commercial lenders. Lastly, the income made through other investments must be taken into account as this income also partly covers the costs of MFBs. Taking all of these factors into consideration, we can approximate the interest revenue that an MFB must realize on its portfolio in order to operate sustainably and profitably. Ideally, the APR charged on average by a MFB should thus come out close to the target portfolio yield estimated with these factors. To be more precise: in theory the required yield

10 This will also cover some aspects of market-environment such as typical cost of funds. Since they can be expressed as costs for MFBs that are passed on to customers they will be dealt with in this section.

on the loan portfolio determines how much should be charged on all the loan different loan products the MFB offers.

This presents a methodological challenge: Most banks offer different loan products with distinct risk profiles and often targeted at a different clientele. Thus naturally, they will charge different APRs for each product. For example, the bank might have a small high-risk segment served with very expensive products and a big portfolio of rather cheap loans to cater to the mass market. The required yield on loan portfolio should then equal the weighted average of the APRs of all the loan products that the MFB offers.[11]

Before going into the details of the calculation and performing an estimation as proposed above, several more things must be clarified: Firstly, calculating the required yield on portfolio is not an exhaustive measure to grasp all variables of price-setting. The calculated required yield must thus not be taken for a definite amount that MFBs should charge in the sense of calculating a "right price of loan products" for them. It shall give a standardized value against which we can compare loan prices in order to see whether certain patterns between the two exist. We emphasize that the calculated yield should not be taken as a benchmark for what MFBs ought to charge, because we use very generous assumptions (see below). The assumptions e.g. for target returns on equity are chosen very high and thus would "allow" MFBs to charge high APRs. The results of the calculation are thus suitable for standardized comparisons, but will not necessarily be meaningful in their absolute value.

Secondly, a particular numerical result for the target yield calculation does not hold any information on whether such price-setting would be justifiable or fair. An example might clarify this: if an MFB has very high *operating costs* and *loan losses* may bring up the calculated yield significantly; in such a case the MFB would need to charge higher APRs for loans in order to perform sustainably. However, passing on high *operating costs* to customers is often unfair, as the costs are based on internal inefficiencies and/or weak productivity. On the other hand, the *cost of funds* are to a large extent external, as the interest paid on deposits and to (international) lenders is usually market driven. Passing on such costs to customers can thus be legitimate. The fact whether price-setting is fair or not thus depends on the individual cost components which add up to the required yield on the portfolio; thus the indicator must be analyzed with respect to all of its components. There are also cases where high *operating costs* are inevitable, e.g. if MFBs are very young and still in the phase of expanding heavily and establishing their space in the microfinance market. Initially, the *operating costs* relative to the loan portfolio are always very high.

However, it must be emphasized that in our experience, most young Nigerian MFBs incur excessive operating costs not because the markets are undeveloped, but rather because of poor management. Typical examples we experienced were business operations starting sig-

11 In theory the different time structures should also be included in the calculation, as e.g. agricultural products might only sell in certain seasons and thus the portfolio composition changes throughout the year.

nificantly overstaffed at start-up and a tendency to purchase unnecessarily expensive equipment. In our survey, the start-up cost issue does not pose a significant problem, since there is only one recently launched MFB in the sample (see Table 5).

| MFBs' ages | 1.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 5 | 5 | 6 | 18 | 18 | 20 | 20 | 20.5 | 20.5 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Table 5: MFBs' ages in years**

We will perform different calculations in order to assess better whether the prices charged are due to internal inefficiencies or external factors. First, we will estimate what MFBs would have to charge in order perform sustainably using their actual costs. Due to poor accounting standards, however, data on investment income beyond the revenues generated on loans is scarce and unreliable. Thus, the first estimation operates under the assumption that all costs must be recovered through the yield on the loan portfolio. This is not a minor issue for the Nigerian market, because MFBs use a significant part of their assets for other activities. On average, the loan portfolio at the MFBs in our sample only accounts for 48% of total assets. Thus, the assumption that all costs must be recovered through a portfolio that represents less than half of all assets may drive up the target yield and heavily distorts the results.

We will try to correct for this distortion in a second target yield estimation, where we assume that only part of the costs have to be covered through the yield on the loan portfolio.

In a third step, we will use benchmark data for the Nigerian MFB sector on *operating costs*, *loan loss* and the asset structure in order to judge whether the costs passed on to customers are fair. The results can then be compared to the actual APR charged by MFBs to see in which way the costs influence pricing.

A simple formula to estimate the required portfolio yield can be expressed in the following terms:[12,13]

$$R = \frac{AE + LL + CF + P - II}{1 - LL}$$

Whereby *AE* is the Administrative Expense Rate, sometimes also referred as Operating Expense Rate; *LL* is the loan loss rate, the annual loss due to uncollectable loans; *CF* is the *cost of funds rate*, it is a projection of the market costs of borrowed funds; *P* is the *profit margin*, it represents the net income before tax; and *II* is the *investment income rate*, all of which are expressed as a percentage relative to the average gross loan portfolio.

12 For more details on the methodology and more sophisticated models to determine the APR see CGAP (2002). For a detailed description how the formula's variables are calculated see CGAP (2002) and Ledgerwood (1999): Microfinance handbook – An institutional and Financial Perspective, p.149-151.

13 All following estimations are based on individual MFB data, however, the individual MFB data is consolidated to averages. This method is used mainly for the purpose of illustrating the methodology of the different calculations. A MFB specific comparison will be delivered below and more information on specific MFBs can be found in Annex III. Moreover, it has to be pointed out that values for 6 MFBs were omitted from the following estimations due to poor performance data; 5 because they did not report loan loss and 1 because it does not report operating expenses.

Before such a calculation can be administered, this formula must be slightly adapted as the data available on *investment income* is unreliable:

$$R + \frac{II}{1 - LL} = \frac{AE + LL + CF + P}{1 - LL}$$

In mathematical terms: there is no reliable data for calculating II/(1 - LL). It becomes an error term. Thus when calculating (AE+LL+CF+P)/(1 -LL), the resulting value is deemed to include unknown additional income that can be generated from other investments. The required yield calculation is consequently very conservative from the perspective of a MFB and "allows" for charging higher interest rates than is actually needed, given the presence of other revenue generating assets.

The calculation of the *cost of funds rate* and the *profit margin* require some assumptions. The liabilities and equity of MFBs are usually disclosed in the categories of *deposit liabilities*, *other current liabilities* and *long-term liabilities*. None of the banks in the sample have *long-term liabilities*, thus they can be dropped.

The *cost of funds rate CF* can be estimated using the standard assumptions for the rates paid on deposits and short-term borrowings as per Table 6. These rates are then weighted at the actual deposit and borrowing volumes found for each particular MFB.

Table 6 further shows the logic used for deriving the required profit margin *P* based on the balance sheet structure of a particular MFB and the standard return on equity assumption imputed for all MFBs. At 30% p.a. the annual pre-tax return on equity is deemed sufficient to achieve real capital preservation and provide an attractive additional return to investors that will support sustainable portfolio growth.

| | | Cost of Funds Assumptions |
|---|---|---|
| **Interest paid on deposit liabilities** | 3% p.a. | Typical market rate for MFBs |
| **Interest paid on short-term borrowings** | 15% | Typical market rate for MFBs |
| | | **Translation of RoE into Profit Margin** |
| **Desired pre-tax RoE** | 30% p.a. | Annual pre-tax return on equity target assumed for all MFBs (ROE) |
| **Equity / Total Assets** | 20% (example) | Capitalization or leverage ratio (CAP) as per the specific balance sheet structure of the MFB. |
| **Gross Loan Portfolio / Total Assets** | 50% (example) | Portfolio to total assets (PF) ratio as per the specific balance sheet structure of the MFB |
| **Required Profit Margin P** | 12% (example) | Calculated using the above as: P = ROE * CAP / PF |

**Table 6: Assumptions used for calculation of required yield on portfolio**

All of the assumptions in Table 6 are generally conservative with a tendency to overstate the cost to the MFBs. Using these assumptions we calculate three scenarios.

### 1) Total Actual R

The *total actual R* expresses the yield that would have to be realized, if **all** income were to be generated through the loan portfolio. It is thus the simple calculation of of R+(II/(1 -LL)) using the formula stated above. This measure is – as explained above – significantly flawed as Nigerian MFBs invest substantial parts of their assets in products other than microloans (e.g. financial investments). In fact, in the sample on average only 48% of total assets are used for extending microloans. Thus, the *total actual R* becomes very high, as it holds that all income must be made on an asset base that is on average less than half of the total balance sheet. For four of the MFBs in the sample the ratio of the *total loan portfolio* to total assets is even less than 30% which significantly distorts the results. In mathematical terms, the unknown error term II/(1 -LL) therefore tends to be rather high in the Nigerian context in general and within our sample.[14, 15]

### 2) Portfolio adjusted R

The *portfolio adjusted R* tries to neutralize the unrelated *investment income* from the calculation. It estimates the yield that MFBs **must charge** given their actual size of the loan portfolio in order to operate sustainably. Thus it accounts for the fact that some of the MFBs seem to have large parts of their operations in activities unrelated to microfinance. These unrelated activities should be self-financing and not be financed through the revenues on the loan portfolio. The basic idea for calculating the *portfolio adjusted R* is thus to take out the layer of "other unrelated activities" from both the asset and liability sides of the MFB balance sheets.

However, not everything that is not invested in the loan portfolio amounts to other unrelated activities. Prudent microfinance operations require a certain inevitable level of fixed assets, cash and liquid asset reserves in addition to the loan portfolio. Such activities that are inherently connected to microfinance operations should be covered through the return on loan portfolio as well. We therefore propose to take the actual gross loan portfolio of each MFB and add some proportional padding of necessary fixed assets, cash and liquid asset reserves.

In order to portray a realistic picture of MFBs we must estimate how high these additional costs that are needed for microloan operations really are as a percentage of the loan portfolio. Then these costs must be added to the gross loan portfolio.

14 This is especially important for the cost of funds. The calculation of the cost of funds takes into account all liabilities of the MFB. If however only a part of these is actually used for loans, then the cost of funds are significantly overstated.

15 This uncommon asset structure in the sample is presumably the result of MFBs investing heavily in treasury bills which is common in Nigeria. In most countries, investing in treasury bills is not a profitable activity but rather done for maintaining short term liquidity. Investing in treasury bills is thus an opportunity cost for maintaining microloan operations; the situation in Nigeria is quite different: the yield of treasury bills ranges between 12% and 14% depending on the tenor of the bill. Financing such investments through deposits on which MFBs typically offer 3% p.a. is in itself already profitable and thus to a large extent investment activity. The CBN reacted on this common practice of investing heavily in treasury bills financed through deposits by introducing a limit in their revision of Supervisory Guidelines for MFBs of December 2012. As part of the revision CBN limited investments in treasury bills at 10% of total deposits (CBN 2012, paragraph 8.1.1).

We find the portfolio padding percentages with the following argument: As part of the CAMEL Self-Rating Manual for Nigerian MFBs (Hoback 2013) benchmarks for sustainable operations of Nigerian MFBs were developed. A score on a scale from 0 ("Unsound") to 3 ("Sound") has been developed to rate the performance of MFBs concerning individual indicators. The indicator "Loans to Asset Ratio" specifies that a MFB must have a loan portfolio that is at least 67% of total assets in order to score a rating of 2 – "Satisfactory" for its asset structure (see below for more details on the CAMEL rating).

To phrase this exercise as simple as possible: We look at each MFB in the sample and their respective cost structures but pretend their loan portfolio is 67% of total assets; we hold that the remaining 33% do not provide any yield (e.g. property and equipment) and must be financed through loan income – i.e. through income on the 67% of assets – also. The rest of the activities are simply eliminated from the balance sheets.

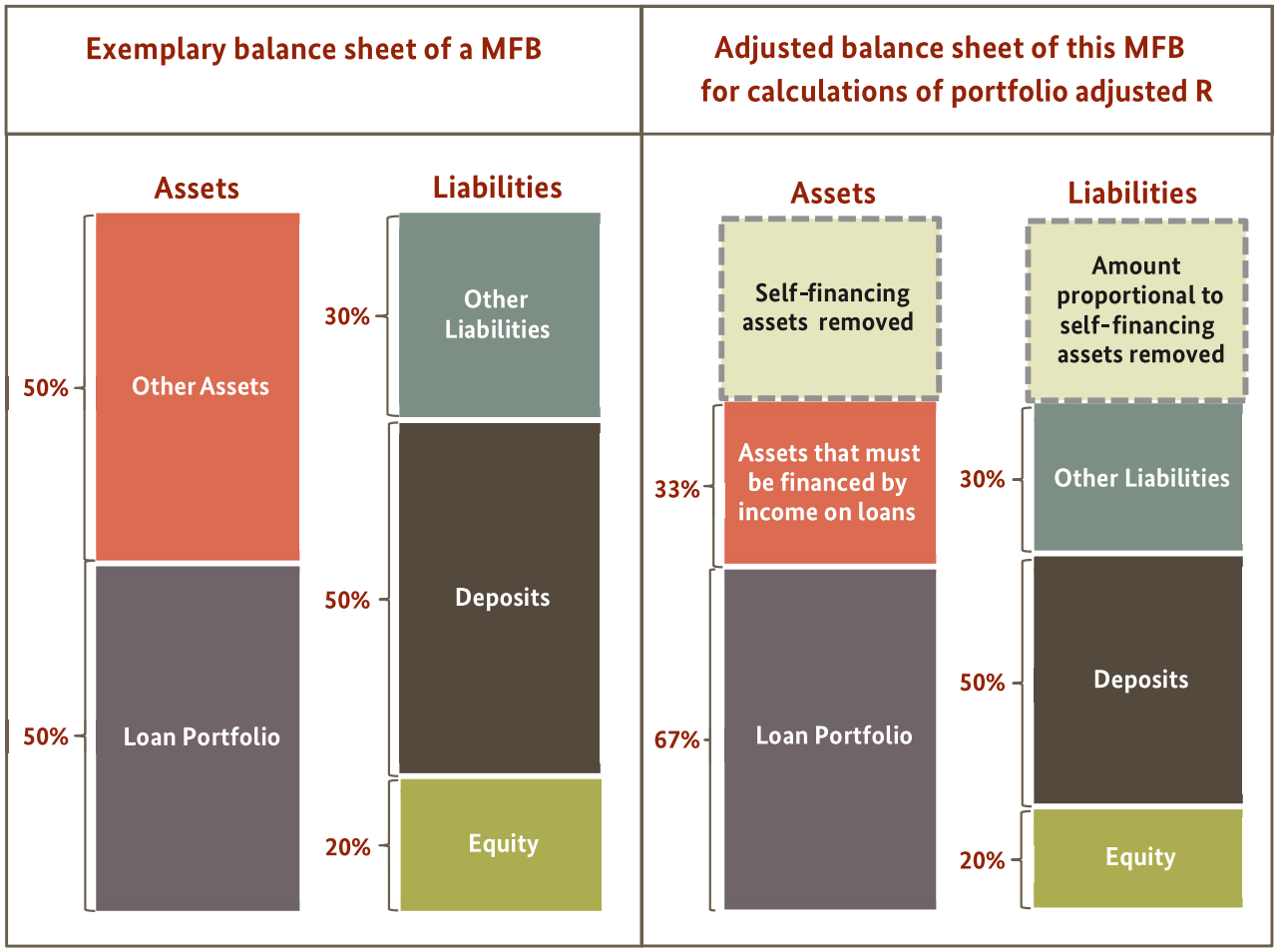


**Figure 5: Exemplary balance sheet adjustments for calculating portfolio adjusted R**

Figure 5 exemplifies this process. Taking this value of 67% from the CAMEL toolkit as the basis for our calculations is very generous as this "Loans to Asset Ratio" (LtA) is far from what

is expected of a well-managed MFB. In an international context, MFBs would expect to have an LtA of around 80%.[16]

For this study, this means that the asset side of an MFB's balance sheet could have proportions such as 67% loan portfolio, 9% fixed assets, 9% cash and settlement balances and 15% liquid assets of which all are financed through microloan operations.

In order to include this into our calculations we need to express these figures as percentages of the loan portfolio; they must be rebased to the 67% loan portfolio. Doing this, we obtain 13.4% fixed assets, 13.4% cash, 22.4% liquid assets; in sum this means that on top of each loan portfolio, we add another 49.2% of this portfolio in assets that must be financed through loan income in order to account for the opportunity costs of maintaining a prudent asset structure. No such pro-rata allocation to core microfinance activities is necessary for the *loan loss*, however. Since the *loan loss* is inherently connected to the loan portfolio it seems reasonable to assume that it has to be covered in full through the yield on the loan portfolio.

| | | |
|---|---|---|
| **Administrative Expense Ratio**<br>(referred to as "Operating Expense Ratio" in the original CAMEL rating)<br>**Definition in CAMEL manual:**<br>Is the cost of operations relative to the size if the MFBs' outstanding loans | < 10% | 3 - Sound |
| | >=10%, <=12% | 2 - Satisfactory |
| | >12%, <=15% | 1 - Marginal |
| | > 15% | 0 - Unsound |
| **Loan Loss**<br>(referred to as "write-offs" in the original CAMEL rating)<br>**Definition in CAMEL manual:**<br>Measures the quantity of the portfolio written-off as lost and removed from the balance sheet. | <=2% | 3 |
| | >2%, <=3.5% | 2 |
| | >3.5%, < 7% | 1 |
| | >7% | 0 |
| **Loans to Asset Ratio**<br>**Definition in CAMEL manual:**<br>Assesses the amount of loans relative to the amount of total assets held by the MFB. | >75% | 3 |
| | <75%, >=67% | 2 |
| | >=60%, <67% | 1 |
| | <60% | 0 |

**Table 7: Benchmark values taken from Hoback (2013)**

The *total actual R* and the *portfolio adjusted R* still do suffer from one error. Both measures use the actual costs of MFBs to estimate the necessary yield on the portfolio. In order to assess whether these costs are justified, we must look at all different cost components and

16 Based on PEARL Guidelines of World Council of Credit Unions. See: http://www.woccu.org/financialinclusion/bestpractices/pearls/aboutpearls.

compare them with benchmark values. This type of standardized comparison is the purpose of the *benchmark R* below.

### 3) Benchmark R

The *benchmark R* represents the yield that an MFB would need to realize on its portfolio if it performed efficiently and were to cover all costs through their loan portfolio only. It is an estimation of what the MFB **should charge** in order to perform sustainably.

The inputs used to calculate *benchmark R* must take into account the specific context of the Nigerian MFB sector. Such benchmarks were developed as part of the CAMEL Self-Rating Manual for Nigerian MFBs (Hoback 2013). It must be stressed that these benchmarks are conceived specifically for the Nigerian microfinance sector and are based on country-specific costs of doing business. As specified above the scores range on a scale from 0 ("Unsound") to 3 ("Sound") to rate the performance of MFBs concerning individual indicators. The relevant components of the *benchmark R* are displayed in Table 7. For our calculations we use the minimum value that will still yield a rating of 2 ("Satisfactory"; marked green in the table).

For example, in the case of the *operating expense ratio* we use the 12% limit. Similarly, for the *loan loss ratio* we use 3.5% as a benchmark. The third ratio is used to calculate the *cost of funds* and requires a more detailed explanation: It calculates the total *cost of funds* using the actual cost structure for each specific MFB. However, we include that their loan portfolio should equal at least 67% of their total assets.[17] Thus the *benchmark R* is the yield that the MFB would need to realize, if it operated with a "satisfactory" cost- and asset-structure.

Figure 6 shows the results of the calculations as the average of all MFBs in the sample.[18]

The large drop from the *average actual R* to the *average portfolio adjusted R* highlights the large use of funds for investments outside the loan portfolio. Even more meaningful is the comparison of the individual cost factors between the *benchmark R* and the *portfolio adjusted R*, which signifies the difference between what MFBs **must charge** in order to cover their cost and what they **should charge,** if they operated satisfactorily. It becomes obvious that the largest difference between the two stems from the *operating costs* and the *loan loss*. The *cost of funds* are however almost equal (13% and 14%). Thus the biggest contributing factor to the high necessary yield that MFBs need to realize largely go back to internal inefficiencies of MFBs which are passed on to customers. Moreover the data supports that the benchmark values are feasible. In fact four of the MFBs score a *portfolio adjusted R* that is smaller than

17 In the sample there are two MFBs with a loan to asset ratio higher than 67%. In theory it could make sense to use their actual loans to asset ratio to calculate the benchmark. However, this would "punish" those MFBs with a better loans to asset ratio as it would decrease the benchmark R they should charge. Since the benchmark R is a forward looking ratio, we hold that it is justified for them to account for such higher costs in case they want to increase their share of investments outside the loan portfolio. The same logic applies for the calculation of the benchmark R.

18 All presentations of R are broken down into the contributing cost factors. It is important to note that the bars are rebased to show the cost components as percentages of the performing net portfolio and not of gross loans: R+II/(1 -LL) = AE/(1 -LL)+LL/(1 -LL)+CF/(1 -LL)+P/(1 -LL) The bars simply add up all those components on the right hand side of the equation and show how much they contribute to the total value of R including the investment income term.

their specific *benchmark R* (see Figure 7 and Annex III), i.e. their actual costs are lower than the benchmark. For two MFBs the two figures roughly match.

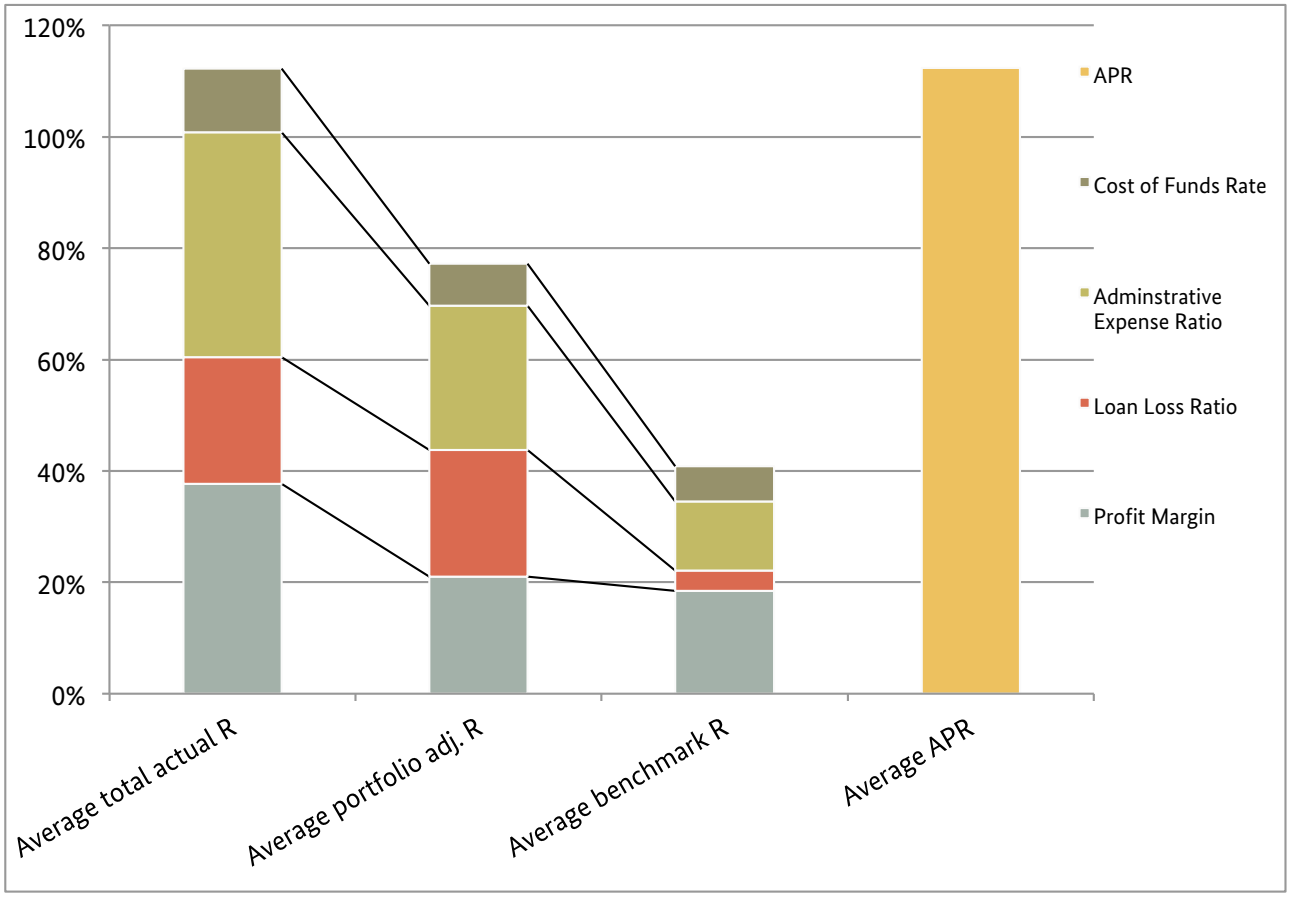


**Figure 6: Required yields vs. benchmark yield vs. APR**

The high costs of most MFBs seem to be carried on to the customers. This becomes obvious when comparing the *portfolio adjusted R* to the *average APR*, i.e. the difference between what MFBs **must charge** and what they **actually charge**. The large difference implies that MFBs charge considerably more than what their already high costs would require. However, in order to fully understand these pricing practices, looking at averages is not sufficient. Seeing how MFBs actually take into account their internal cost situation to determine prices requires a case by case analysis for the individual MFBs.

Before turning to a detailed comparison between required yields and APRs, some details about the calculation of the latter must be discussed since there are methodical challenges involved. Theoretically, the required yield on the loan portfolio (*R*) should equal the weighted average of the APR of all loan products sold throughout the year by each MFB. The average would have to be weighted by the volume of each loan product within the total loan portfolio. Unfortunately, our sample data does not cover **all loan products** that the MFB actually offers, only the APRs of the **most frequently sold products** were surveyed. It must thus first be determined whether these samples are representative for the whole portfolio. In fact, twelve of the sixteen MFBs for which the *R* was calculated provided detailed information

about the composition of their portfolios. For ten of those twelve MFBs of our sample covers the entire portfolio, for the remaining two it is 73% and 84% respectively.[19]

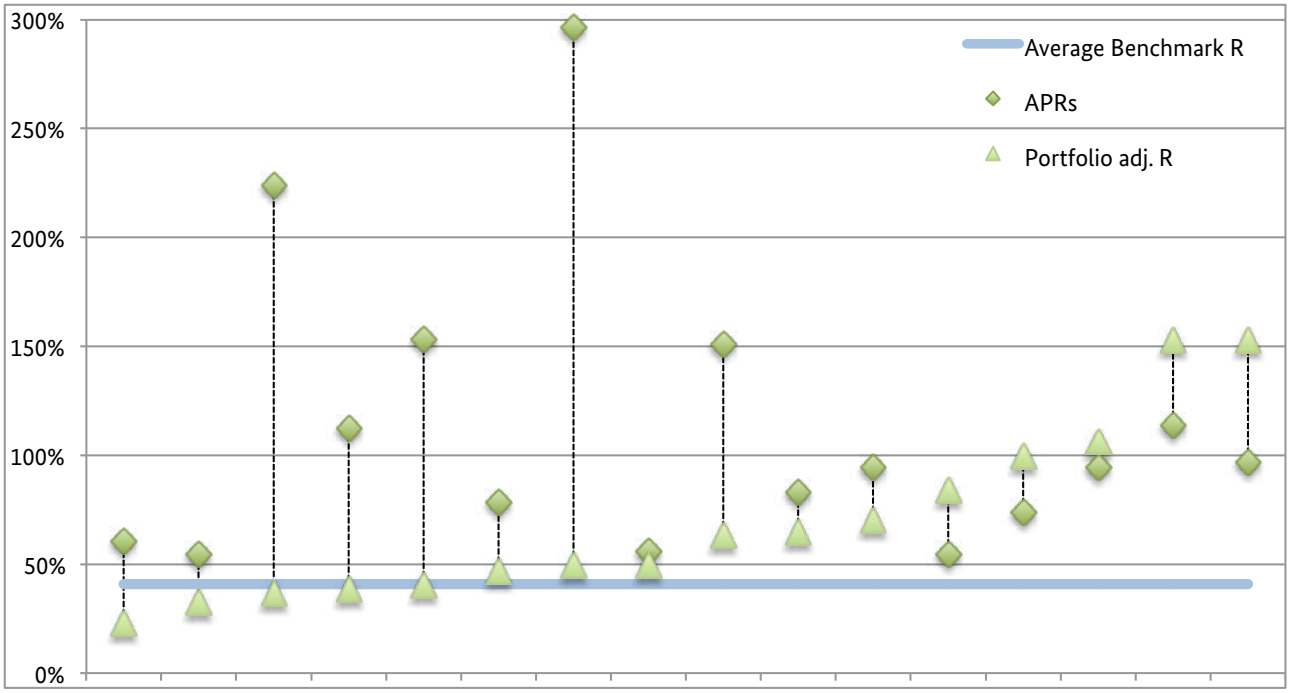


**Figure 7: Portfolio adjusted Rs vs. APRs for specific MFBs**

Based on these figures we are confident that the largest part of the portfolio is covered for the entire survey; even for those MFBs who did not submit full detailed data. Accordingly, we were able to calculate the weighted average APR for twelve of the sixteen MFBs; for the remaining four MFBs the simple average APR was used (for more details see Annex V).

Based on the individual MFB calculations, we looked for a possible correlation or pattern between the APR and the required yield on portfolio. In Figure 7 every pair of APR and *portfolio adjusted R* represents one MFB. It becomes apparent that there is no clear pattern between internal cost-factors and the APRs charged i.e. there is no indication that the APR and the required yield on loan portfolio roughly match or at least have comparable differences. In fact some MFBs even charge APRs well below their necessary yield. Thus it seems that even though the high inefficiencies tend to drive up the APRs overall, the general pattern of pricing in Figure 7 does not appear rational. Moreover, the display reveals that six MFBs actually outscore the benchmark or range very close to it which shows that the estimation of the benchmark yield is in fact achievable.

19 In fact for two MFBs the total amount outstanding for the loan products in the sample divided by the total loans outstanding as of December 2013 yielded a result of 101% and 103% respectively. This is presumably due to the reason that the figure on loans outstanding on each loan product are collected for internal controlling purposes and follow different rules concerning depreciation than the official figure on the total loan portfolio provided to CBN. Another possible reason might be that MFBs submitted data as of the date they filled out the questionnaire which was slightly later than the official publication of their official figures even though they were asked to provide figures as of December 2012. During that time the portfolio could have grown which would explain the slight difference. In any case we can safely assume that during this short time the portfolio did not grew in a rate which renders the original sample unrepresentative.

## Internal Drivers of APR – Young vs. Old

It is basic economic theory that new enterprises are less productive and profitable. In fact, most MFBs do not make money within their first five years of operation as the firm increases its portfolio size and finds its place within the market. Also, it takes time for bad firms to fail and these firms push up the required yield of the sample that are less than 5 years old. Figure 8 appears to support such a theory.

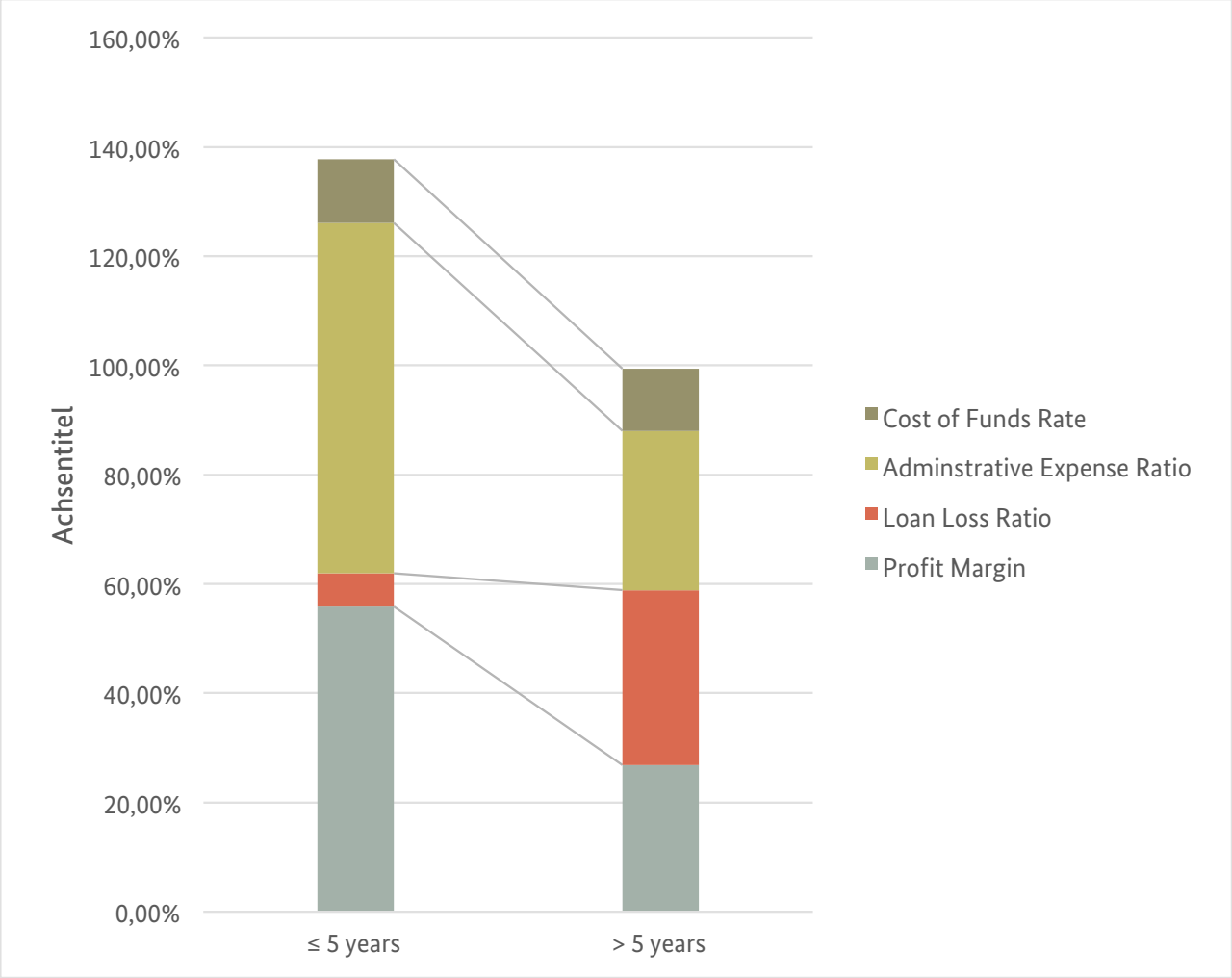


**Figure 8: Actual R and Age comparison**

Carrying out the Actual R calculation used earlier in this paper, we see that the required yield for Nigerian MFBs that are less than 5 years old is significantly higher than for older, better established MFBs. The administrative expenses of the MFBs fall by more than 50%, from 64.15% to 29.13%. Furthermore, while the return on equity for older institutions increases in the sample, the required yield to maintain an adequate profit margin falls substantially; meaning the MFB is earning more while, in theory, being able to charge clients less. However, one interesting observation is that the costs associated with Loan Losses actually increase rather than decrease with age; this seems counterintuitive. Older MFBs should be better engrained within their communities meaning they are better able to appraise suitable loan

candidates. They should also be better equipped to collect loans than new MFBs as they have gone through the process more times and have developed best practices through experience. In fact, higher loan losses among older MFBs can be attributed to two reasons: 1) An accounting issue whereby MFBs have an observed tendency to not write off bad loans, and 2) MFBs continue to have issues with loan appraisal and collection. Essentially what the latter point tells us is that as the portfolio grows, loan losses grow at a disproportionally higher rate as well. This indicates a dire need to further improve credit appraisal and collection processes at Nigerian MFBs.

When observing the high required yield and APR of the Nigerian microfinance banking sector, it is also interesting to consider the fact that the sector is quite young and MFBs have only been operating under the purview of the CBN since 2005. While some have operated as non-regulated MFIs/community banks before this time, the formalization of the sector led to an unprecedented wave of new MFBs entering the market. Based on this information and the findings shown in Figure 8, one may argue that over time we can expect the required yield of the Nigerian microfinance banking sector to decline over time. As the sector matures, the average age of MFBs will increase while some of the bad banks established in the excitement of the sectors creation will close their doors. In turn, one could expect the efficiency of the sector to improve and interest rates to decline, although one pressing concern is that loan losses continue to rise with age and may consume these gains. Only time will tell if such a hypothesis is appropriate.

## 3. Sample 2

As discussed in Section 1.1, in response to the feedback of the CBN, Unit MFB management, and members of the Nigerian Microfinance Platform when sharing the findings of Sample 1, a second sample was conducted and analyzed. Members of the Microfinance Platform, including the 15 largest MFBs in Nigeria, argued that the findings of Sample 1 did not appropriately reflect the entire sector as all but one of the institutions assessed were Unit MFBs. Unit MFBs are small in size, with a capital base between only NGN 20 and 100 million. Feedback suggested that those Unit MFBs are likely to be less efficient and due to their small size lack the potential for economies of scale necessary to drive down costs. Based on this feedback the SEDIN programme offered to conduct the follow-up survey.

| Indicator | Average - Sample 1 MFBs | Average - Sample 2 MFBs |
|---|---|---|
| Total Assets | 131 623 000 | 2 104 202 000 |
| Total Loan Portfolio | 65 272 000 | 1 374 729 000 |
| Total Deposits | 51 768 000 | 788 730 000 |
| Capital & Reserves | 52 538 000 | 736 425 000 |
| Net Income | 6 138 000 | 108 544 000 |

**Table 8: Key indicators of Sample 1 & 2**

The better data quality of Sample 2 allows the analysis of internal cost drivers to be deeper and more detailed. In the APR analysis of Sample 1 (2.2), it was found that operating expenses and loan losses, rather than external factors such as funding costs, are the core cost drivers of MFBs' required yield. However, due to the limitations of the data collected in Sample 1, we were unable to narrow in and clearly define which specific operating costs were highest for Nigerian MFBs; controllable or uncontrollable costs. Thus, with the better data quality of Sample 2 we respond to platform members' argument that the required yield cannot be reduced as the core drivers are *uncontrollable costs.*

Based on our assessment, it appears the argument that Sample 1 findings do not reflect larger MFBs in the country is neither wholly false nor true. Essentially, most Sample 2 findings were similar to those found in Sample 1, but observed in lesser extremes. APRs were lower yet still high with a spread that was smaller yet still wide. Furthermore, there was still no conclusive relationship between APR and product features (loan tenor, amount) or loan purpose, although one should be careful not to overstate this finding, especially for Sample 2, due to the small sample size. In our assessment of MFB cost drivers, the study finds that there is a clear difference between the *perception* and *reality* as to what the core operating costs of the sector are. The preconceived notion by MFBs that the required yield is derived from uncontrollable costs (such as management costs, taxes and power costs) is not supported by the data since the highest expenses were found to be 'Other' overheads and expenses.

For the APR analysis and the assessment of internal drivers of APR, the same methodology as explained Sections 1.3 and 2.2 "MFB internal drivers of APR" is used.

## 3.1. Sample 2 Product Features

| Loan Type | Number |
|---|---|
| Business | 11 (55%) |
| Agriculture and Business loan | 1 (5%) |
| Agriculture, Business and Consumption loan | 3 (15%) |
| Business and Consumption loan | 5 (25%) |

**Table 9: Distribution of loan types in the sample**

As displayed in Table 9, the most commonly reported microloan product offered by the MFBs are business loans (55%) followed by dual purpose business and consumption loan products (25%). Loans catered to agriculture or consumption make up the remainder of the loan product offerings.

Due to the size advantage of MFBs assessed in Sample 2, the range of loan amounts (Table 10) is significantly wider. This presumably goes back to the fact that Unit MFBs are more restricted by CBN in terms of single obligor limits. Regulations dictate that individual loans cannot be larger than 1% of total shareholders' funds, unimpaired by losses. Furthermore, loan tenor lengths are generally longer for the Sample 2 MFBs. The reasons for this are not entirely clear, but it likely relates to the ability of larger institutions to absorb the risk associated with longer durations due to the diversity and size of their portfolios.

All loan products across the MFBs require fees and/or commissions ranging between 1% and 3% of the loan amount. Compulsory savings (under different names) were also required in 12 of the 20 (60%) loan products. However, as with Sample 1 the compulsory savings requirements vary widely; ranging from a minimum balance of NGN 1000 or 10% to 30% of the total loan. Most loans had monthly installment periods, though one agriculture loan offered quarterly repayment of interest and principal.

| Type of loan | Range (NGN) | Average loan tenor |
|---|---|---|
| Business | 27,000 – 3,000,000 | 8 months |
| Agriculture and Business loan | 75,000 – 1,000,000 | 6-12 months |
| Agriculture, Business and Consumption loan | | |
| Business and Consumption loan | 200,000 – 1,500,000 | 8-15 months |

**Table 10: Range of loan amount and average loan tenor**

When compared to Sample 1, Sample 2 loan products from the same MFB were more consistent in their features and pricing. An interesting observation is the fact that Sample 2 MFBs were more inclined to offer products that cater to a wide range of different needs; rather than a specific niche. For example, in one of the MFBs, only two products were present: a 'Business Loan' and 'Personal Loan'; the latter of which could be used for emergency, school fees, education, housing, trading, farming, working capital, as well as for business activities such as farm inputs, tools & machineries. One hypothesis is that such loan products are catered to salaried workers; and since the MFB knows the funds will be recouped through the salaries deposited, it is indifferent as to how the loan is used. However, this requires further exploration and may be also valid for Sample 1 given GIZ's experience in the sector.

## 3.2. Presentation of Results

### APRs of Sample 2 MFBs at a glance

APRs in Sample 2 range from 39% to 208% with a spread of 169 percentage points, an average of 87% and a median of 78%. Since averages can easily be distorted by extreme values, the median as a measure that separates the upper and lower half of the sample is a more reliable and desirable indicator of the average APR.

| | Median | Average | Minimum | Maximum | Spread |
|---|---|---|---|---|---|
| Sample 1 | 102% | 127% | 39% | 337% | 299% |
| Sample 2 | 78% | 87% | 39% | 208% | 169% |

**Table 11: Descriptive statistical data on APR**

Table 11 shows that Sample 2 APRs have the same minimum APR but the spread, average and median in Sample 2 are significantly lower than in Sample 1 (roughly 1.5 times less).

The loan with the lowest APR in Sample 2 was a product with an average size of NGN 81,000, repayable in equal monthly instalments of principal and interest over a period of 6 months. The monthly nominal interest rate stood at 2.5% on a declining balance with an administration fee of 2.5%; this yields an APR of 39.15%.

The highest APR loan in Sample 2 was for NGN 100,000, repayable over 4 months in equal weekly instalments at a flat monthly interest rate of 5%. The contract additionally required a 20% compulsory savings that attracts 2.5% interest, an administrative and insurance fee of 5%, and an application fee of NGN 500. The APR for this product was 207.83%. As was the case in the highest interest rate of Sample 1, this product's high interest rate is driven by the fact that the loan is offered on a flat rather than declining basis coupled with a weekly repayment structure that reduces the duration for which the client can hold the entire principal of the loan. The collateral is also an indirect cost that drives up the APR of this product significantly.

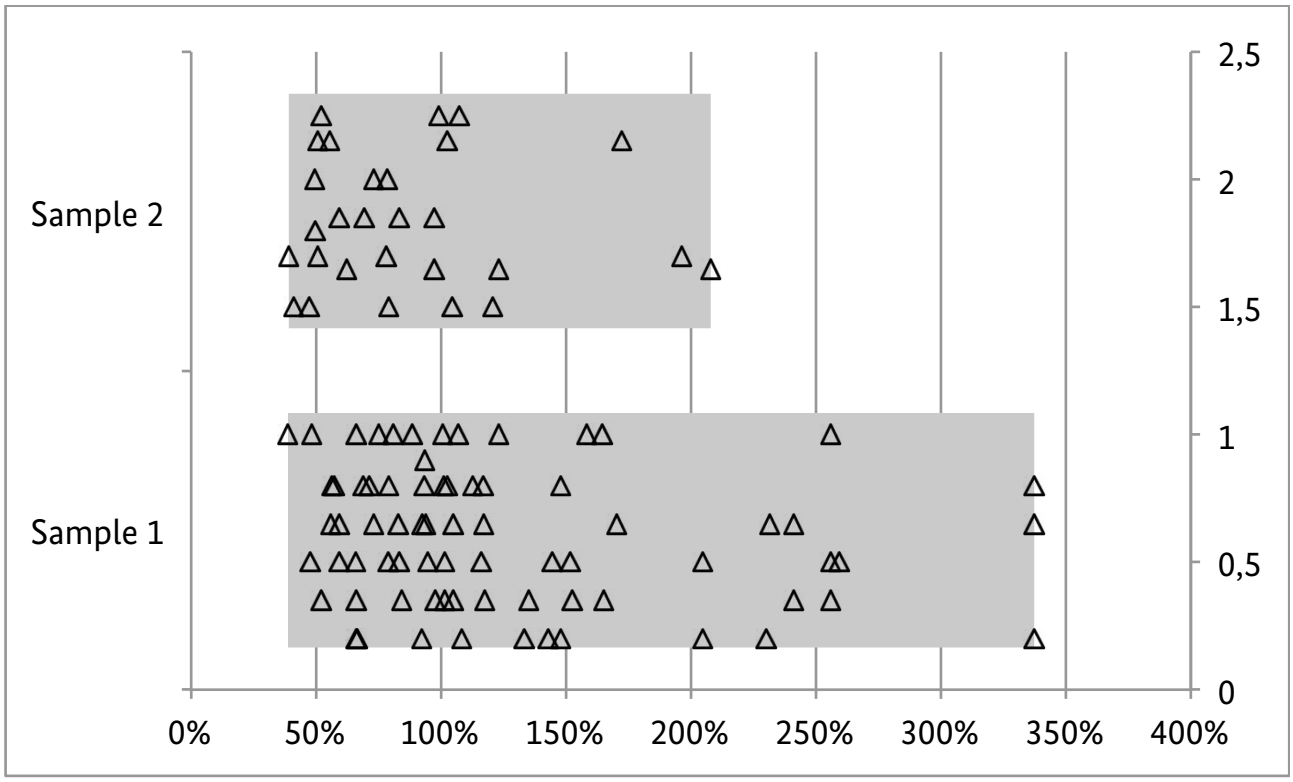


**Figure 9: Range of APRs in Sample 1 & 2**

The spread of APRs in Samples 1 & 2 is represented by the grey in Figure 9 while each triangle represents the APR of one loan. This figure suggests that bigger MFBs (Sample 2) tend to have lower APRs than the Unit MFBs in Sample 1. There are several reasons that might explain this: First, low APRs in bigger MFBs may indicate efficiency gains derived from a wider range of operations that spreads fixed costs across a larger volume of loans meaning that the required yield of the institution decreases (discussed later). In turn, MFBs might share these efficiency gains with their clients by providing products at a lower interest rate. Second, it is important to bear in mind that the larger MFBs found in Sample 2 are more likely to enjoy the benefits of international organizations providing technical assistance and funding conditional on loan portfolio growth and responsible pricing. This support can create positive feedback effects since it creates an incentive for these larger institutions to perform better while also providing them with the means to do so.

## APR and product features

First we test the argument that, in competitive markets, higher loan amounts are associated with lower APRs due to a lower fixed cost per Naira lent. As stressed above, it is important not to overstate the significance of the results due to the small sample size. As shown in Figure 10, though the relationship is slightly stronger in Sample 2 than in Sample 1, the correlation between loan amount and APRs is still insignificant.

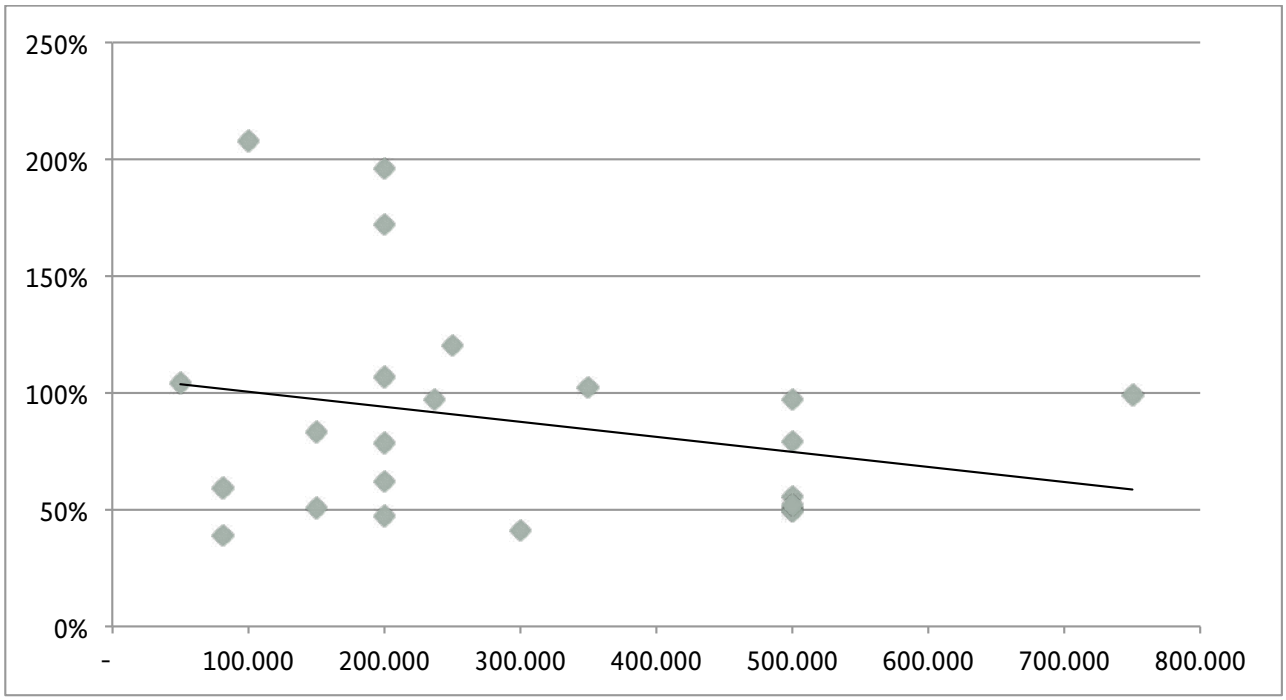


**Figure 10: Sample 2 APR & loan amount (NGN)**

A second proposition is that there is a relationship between loan tenor and APR.

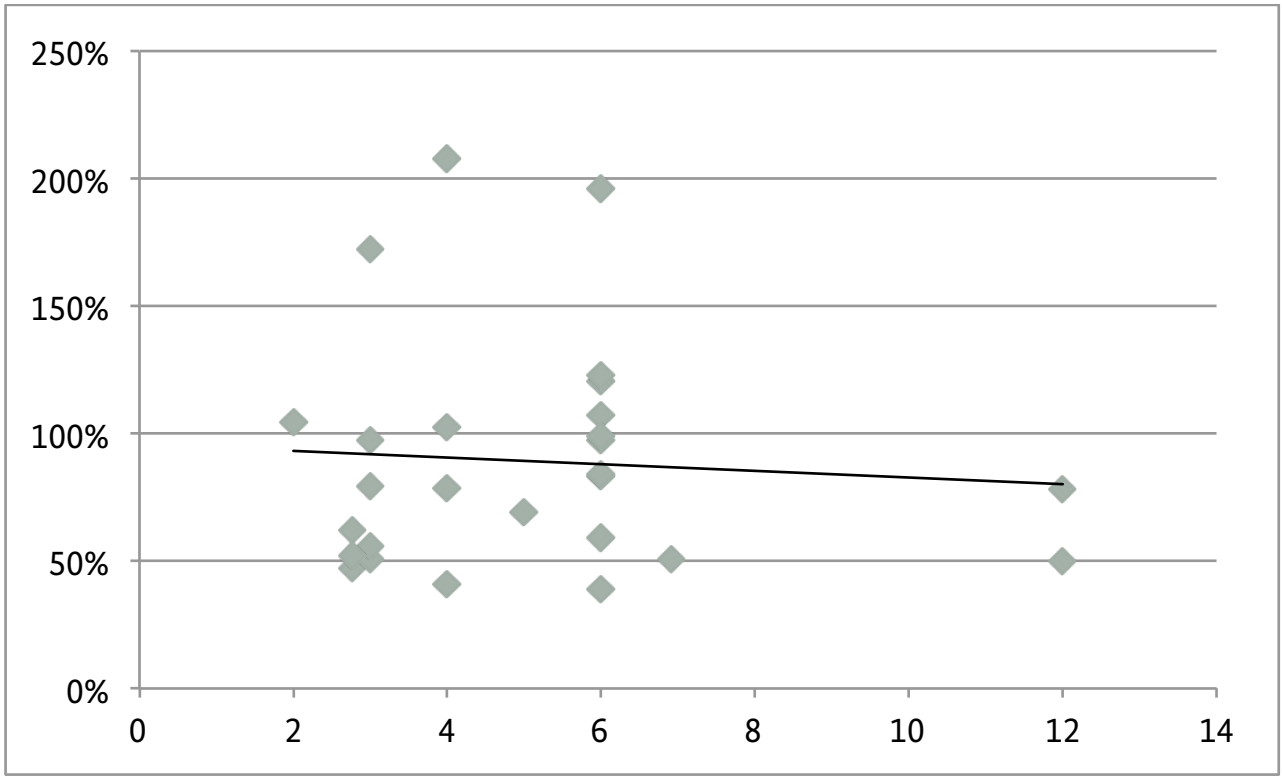


**Figure 11: APR & loan tenor (month)**

Specifically, since loan origination costs are recovered through interest payments made over a longer period of time, APRs should decline the longer the duration of a loan. Figure 11 shows that no relationship between APR and loan tenor is found in Sample 2. The longest loan tenor

is 12 months as usual but most loans have short tenors ranging from 2 to 6 months. This short tenor drives the relationship and shows no distinct pattern. A relationship would likely be much clearer if the duration of loans were more spread as would be found when assessing conventional loan products from commercial banks.

Overall, there is no strong evidence to suggest that Sample 2 APRs are determined by loan amount or the tenor of a loan. As was the case in Sample 1, the relationship is weak.

### MFB-internal drivers of APR

Approached from the perspective of an MFB, the internal costs (cost of funds, operating expenses, loan loss) and the desired return on equity (profit margin) should determine how much money the MFB must charge on its portfolio in order to realize a yield on loans that is sufficient for the MFB to be profitable and grow sustainably. This amount, the **yield on loan portfolio**, should in theory be sufficient to cover all costs and additionally generate a required return on equity for: a) capital preservation, b) paying out dividends, c) being able to access finance, and d) simply being able to maintain a growing loan portfolio. In other terms: one theory of loan pricing is that the required yield on loan portfolio of an MFB should determine the average APR charged by the MFB on its loan products.

To determine whether the internal cost-structure of MFBs is a core determinant in the pricing of microloans, we compared the required yield on a loan portfolio with the actual APR charged. The process for assessing the internal drivers of APR was a rather complex process and required several estimations. Section 2.2, MFB internal drivers of APR, of the report develops and explains in detail the methodology of how to calculate the required yields. In summary, the methodology entails three scenarios for calculating the required yield (*R*): the ***total actual R***, the ***portfolio adjusted R*** and the ***benchmark R***.

In contrast to Sample 1, Sample 2 MFBs on average had a Loan to Asset Ratio close to the 67% used in the calculation of *portfolio adjusted R* (64%). In theory this should mean that the *portfolio adjusted R* and *actual R* of the Sample 2 MFBs are quite similar. However, within the sample, MFBs' LtAs were significantly different, ranging from 36% to 91%. Only the banks with LtA below 67% had to be adjusted accordingly while those above 67% were not adjusted downwards.

The ***benchmark R*** estimate provides the required yield the MFB should charge if it operated efficiently and had a loan to asset ratio of 67%. The benchmarks used to calculate the *benchmark R* was taken again from the CAMEL toolkit (Hoback 2013). It is important to stress that the various CAMEL indicators' benchmarks for satisfactory performance are sensitive to the peculiarities of microfinance operations in Nigeria, such as country-specific cost indicators. In fact, CAMEL indicators, including the OER, are often derived from the CBN regulatory requirements.

The decline from the *actual R* (82%) to the *portfolio adjusted R* (60%) in Figure 12 shows the effect of an adjusted portfolio and asset structure. Further decline from the *average portfolio adjusted R* to the *average benchmark R* shows reduction in the required yield though efficiency gains. A comparison of the components of the *portfolio adjusted* and *benchmark R* (42%) reveals that the decline is driven by a reduction in loan loss rate and a significant reduction in operating expense. Like in Sample 1, MFBs incur high cost of operation derived from what can only be assumed to be structural inefficiencies (discussed further in looking deeper at MFB cost drivers).

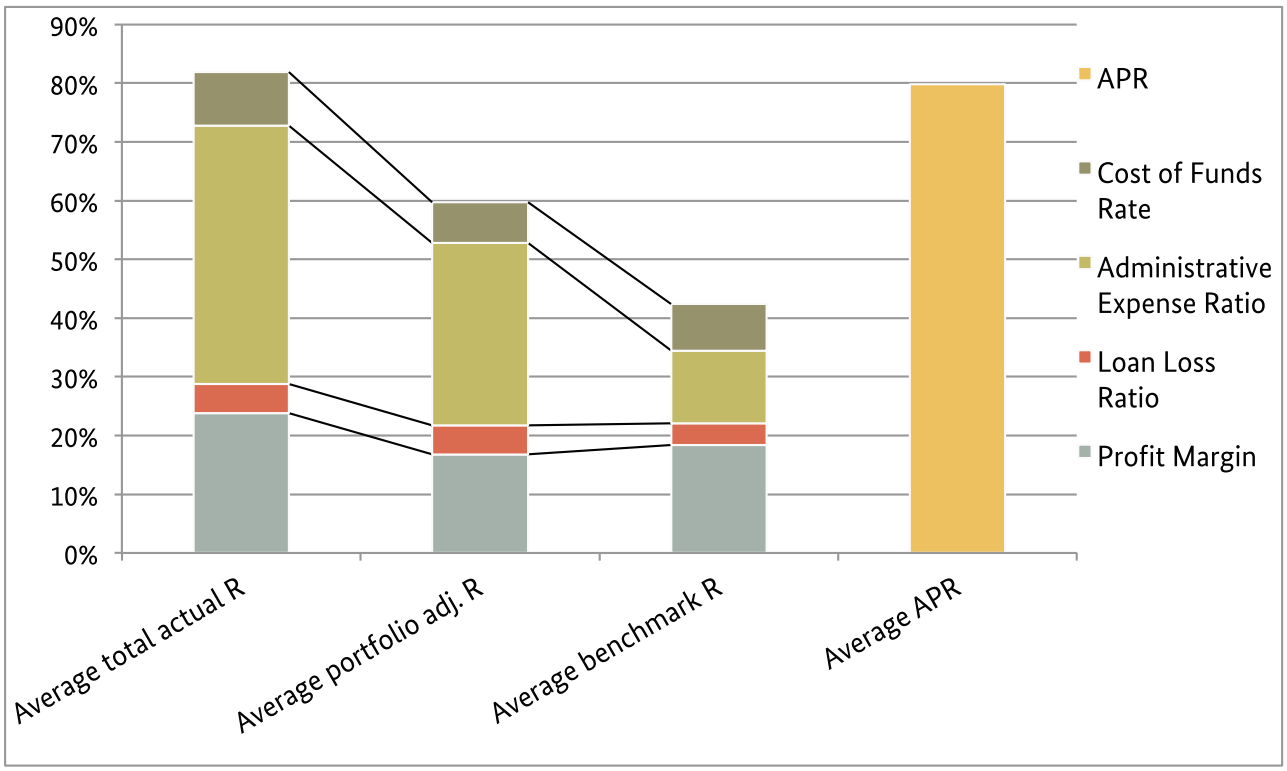


**Figure 12: Required yields vs. APR**

When looking at the individual MFB calculations in Figure 13 we see that the spread of the APR and required yield is significantly smaller than for Sample 1. In fact, most Sample 2 MFBs APRs and Portfolio Adjusted Rs are within twenty percentage points of one another which, when taking into account the assumptions of the underlying methodology, hints at a possible relationship between required yield and the interest rates charged to clients of these larger MFBs.

## Looking deeper at MFB cost drivers

In this section we look in greater depth at the core drivers of an MFB's required yield. The methodology used for this assessment is the same as was applied when computing the *actual R* in previous sections of the report, only with more specific variables. For this exercise

we only assessed Sample 2 MFBs as the data collected in Sample 1 lacked the necessary level of detail.

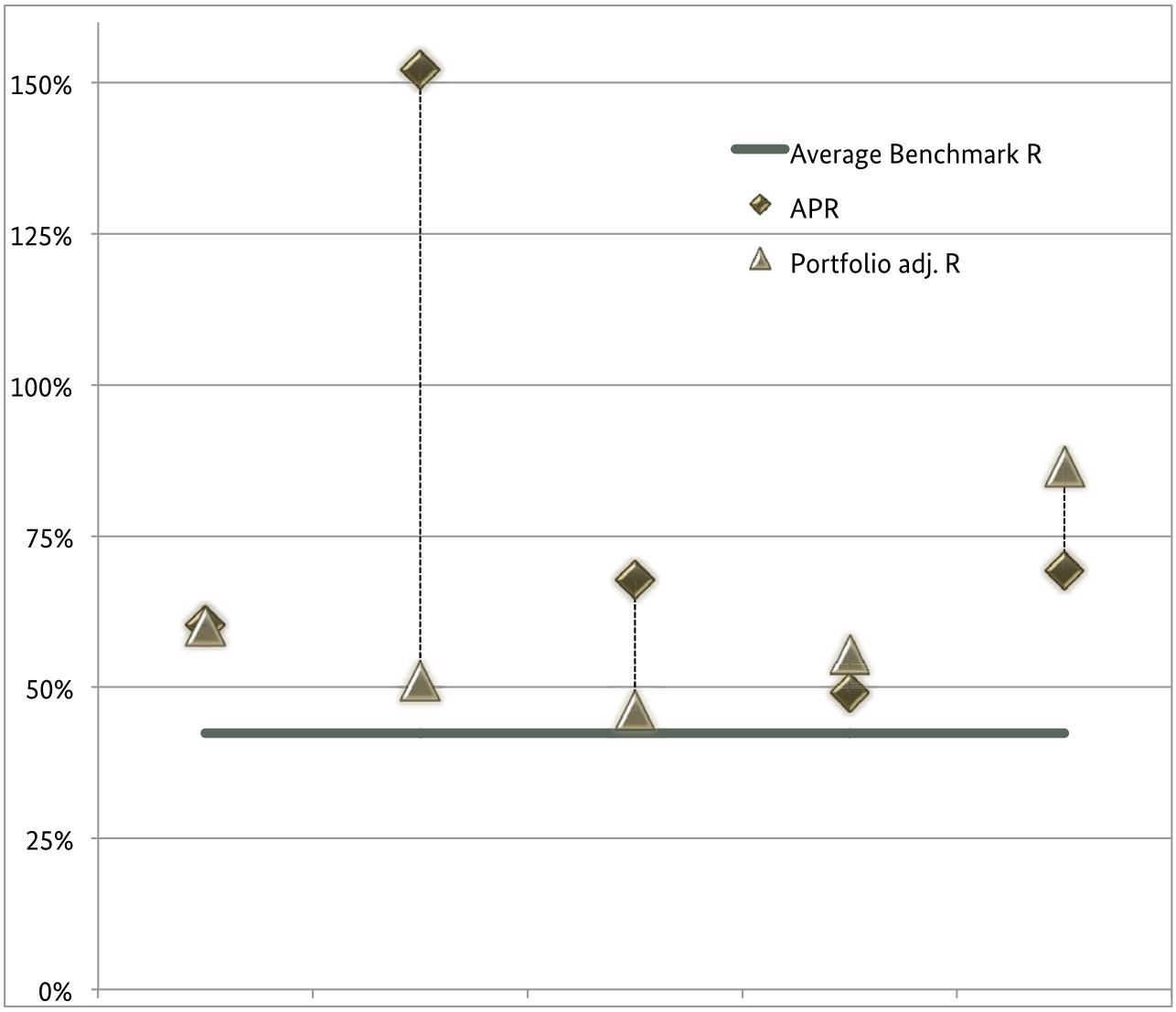


**Figure 13: Portfolio adjusted Rs vs. APRs for specific MFBs**

Before carrying out this analysis, we asked microfinance practitioners what they thought were the core cost drivers of their institutions. Most blamed uncontrollable factors are a) the high cost of management staff due to CBN regulations requiring a minimum of 5 managerial staff, b) the high cost of funds, c) taxes and d) electricity costs. However, as displayed by Figure 14, these are by no means the core cost drivers most affecting the required yield of Sample 2 MFBs. In fact, management costs only contribute to an increase in the required yield by 2.30% (for every NGN 100 lent, the management cost of administering the loan is NGN 2). Furthermore, the cost of funds, taxes and electricity costs contribute only 7.64%, 1.14% and 2.64% respectively. This is in contrast to the high costs associated with "Other" expenses (7.95%) and overhead (25.85%) which is not clearly defined. One hypothesis is that these "Others" may in fact be security costs. A second hypothesis is that it is primarily marketing and training costs associated with deposit mobilization. If the latter is in fact true, it

may mean that the cost of funds is in fact higher than what we currently perceive. There is also a clear need for MFBs to improve their loan loss ratios. Though not apparent in Figure 14, Figure 8 of Sample 1 shows that this is a crucial problem facing MFBs as they expand their operations.

It is also important to look at the MFB with the lowest required yield as it provides us with an idea as to where MFBs may be able to most effectively reduce costs and thus drive down their required yield. The lowest required yield is 42% and the first striking difference between this MFB and the others is that its total staff costs are half that of the next best MFB. This finding seems to match this MFB's reputation for its staff productivity and high client to marketing officer ratio. This MFB also has considerably less overhead in the "Others" category and the highest loan to asset ratio.

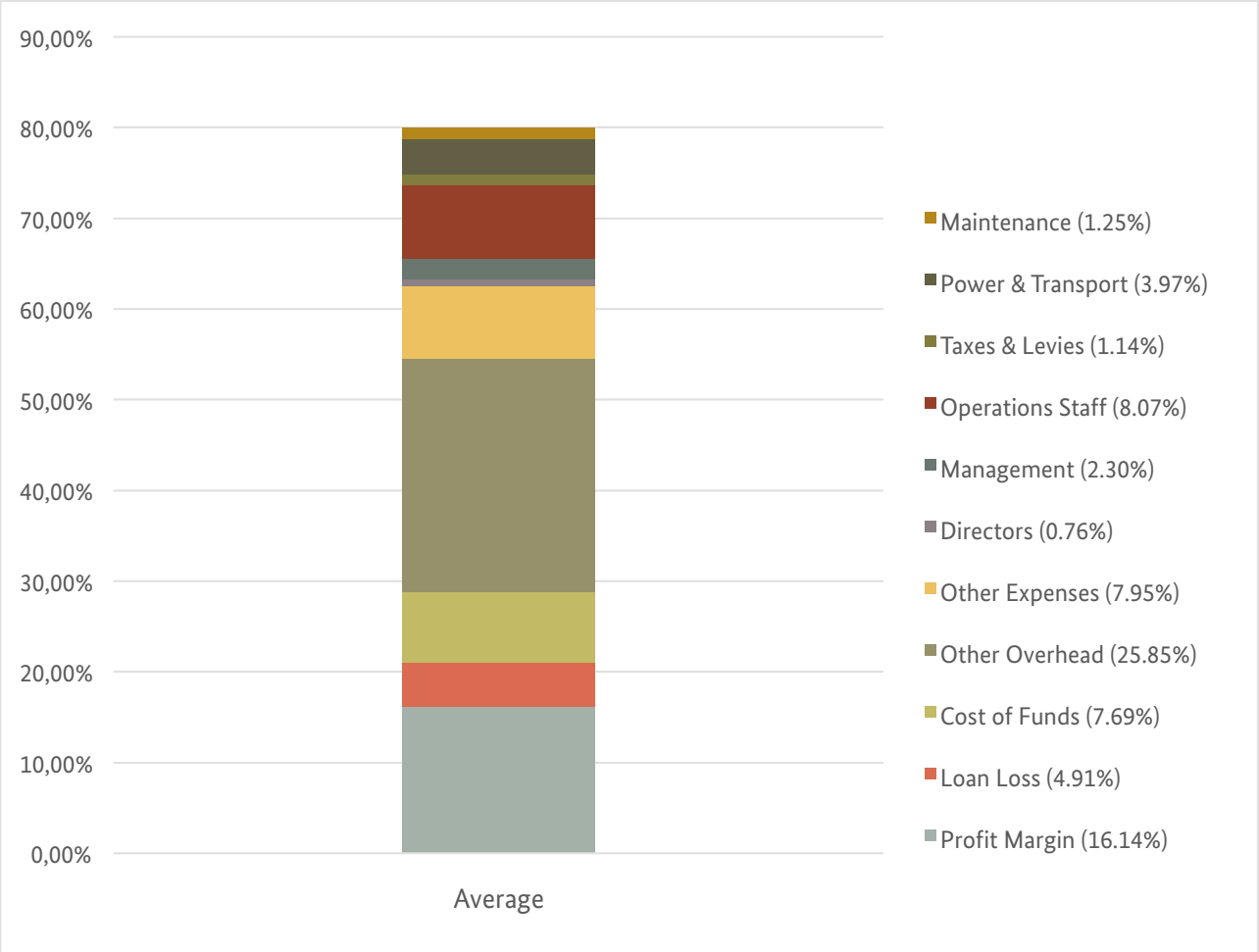


**Figure 14: Further decomposed actual R of Sample 2**

This exercise proved useful in assessing the core cost drivers of MFBs. However it is important to emphasize that practitioners exercise caution when applying these findings to their own institutions. First, the sample size is small (though still telling). Second, the findings represent the largest MFBs in the country and may not adequately reflect smaller MFBs cost structures. For example, in the case of Sample 2 MFBs, the regulatory requirement of a

minimum of 5 staff may not be a serious issue as such big institutions would likely have five management staff regardless. In contrast, Unit MFBs with significantly smaller operations may feel a lesser need to employ so many management staff; thus the regulatory rule does have an effect on costs. However, the more variable costs of power, taxes and funding are likely to be similar in both small and large MFBs.

## 4. Regional Comparison of Interest Rates

As a final exercise, the report compares the APRs of Sample 1 & 2 to microfinance institutions operating in other parts of Africa. Based on this assessment, not only are interest rates in Nigeria high in absolute terms, but also when compared to their foreign peers. The box plot in Figure 15 shows the median, the 25%- and 75%-quartile as well as the minimum and maximum values of the APRs for several African countries.[20] It can be seen that the median Sample 1 value of 102% is the highest in comparison to other African countries. This is 10 percentage points more than Ghana at 89% and 20 percentage points more than Malawi (78%) and Tanzania (79%).

The same is true for the average of 127% which is higher than for any of the other countries, although this figure is usually distorted by extreme observations and should thus not be over-interpreted. Furthermore, it can be observed that the range between the 25 and 75 percentiles within which 50% of the data lies is comparatively wide (shown by the width of the box). The heterogeneity of the APRs in Nigeria is the same as in Ghana, and only Malawi shows a wider spread.

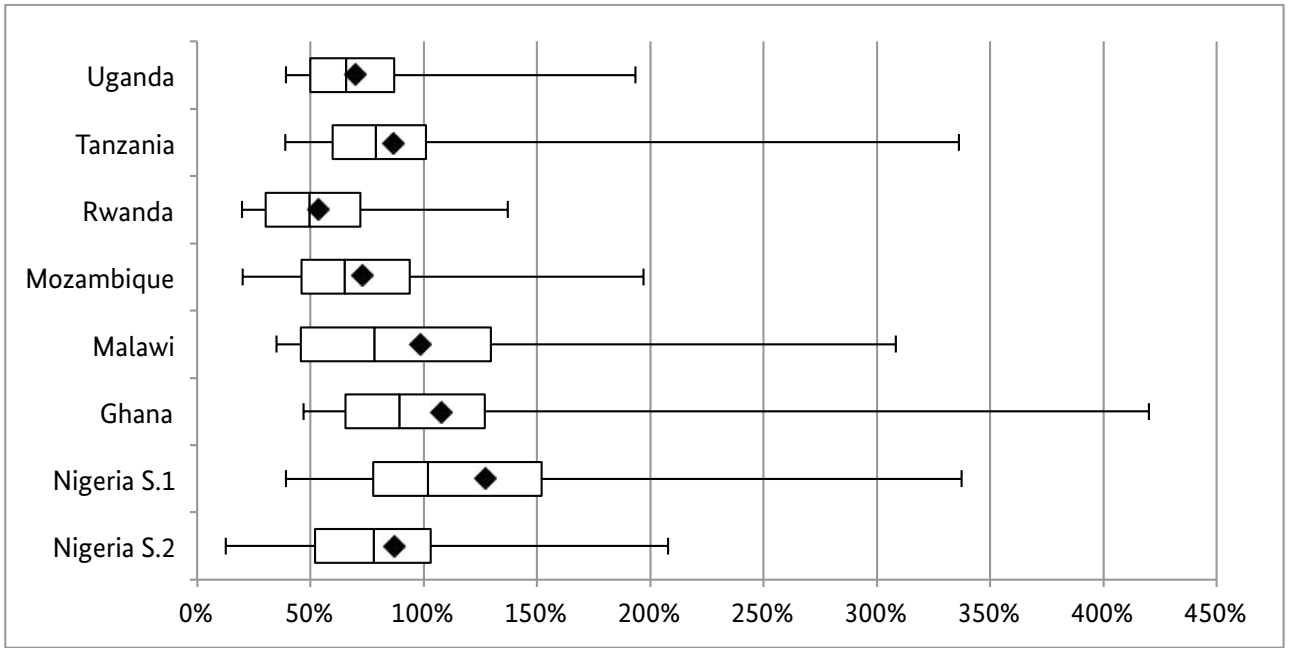


**Figure 15: APRs in international comparison, data source: MFTransparency, author's calculations[21]**

20 The box marks the range in which 50% of the observations lie. The remaining 25% of observations below that and above that respectively lie within the range the area exemplified by the line.

21 Sample sizes per country: Ghana: 753; Malawi: 219, Mozambique: 103, Ruanda: 433, Tanzania: 271, Uganda: 510.

The story Sample 2 tells is more optimistic. However, it is important to bear in mind that this data set is composed of the 7 largest (and hypotetically the most efficient) MFBs in the country while being compared to both large and small MFBs in other countries. The Sample 2 median APR of 78% is similar to MFBs in Tanzania (87%), occupying the middle spectrum of regional interest rates.

## 5. Conclusion and Recommendations

The prices for microloans in Nigeria are high both in absolute terms and when compared to their peers abroad. A high observed required yield indicates that Nigerian MFBs are quite inefficient; while a high APR suggests that these costs are passed on to customers. Furthermore, although high costs generally seem to drive the high APR levels found, there is no clear pattern of how MFBs use internal performance data to price their products. In fact, the markups MFBs charge on their costs differ widely. Moreover, we could see no strong pattern between loan prices and basic loan features such as tenor and amount. Drawing these pieces together yields two conclusions: (1) a considerable amount of MFBs, both large and small, are highly inefficient which in turn is likely affecting prices; (2) there seems to be a lack of knowledge amongst a large number of Nigerian MFBs on rational pricing practices, especially in Sample 1 while Sample 2 reveals a mixed pattern.

It is hard to draw specific conclusions on the pricing policies of MFBs; specifically with regard to how a products' APR is determined. This lack of pricing knowledge may be the result of deficiencies in cost accounting, funds transfer pricing and risk budgeting within MFBs. This is especially true for Sample 1 where some MFBs charge far more than their required yield while others charge considerably less than what is needed to sustain their operation. Taking into account the feedback of many MFBs it would be a first necessary condition to empower MFBs to calculate the APRs they charge, as in fact many MFBs are not aware of the actual price they demand.[22]

Analyzing Sample 2 MFBs' performance data and its relation to the prices of loans, we see that it does not seem to be uncontrollable cost-factors which constrain the price-setting of banks such as cost of funds, CBN regulations, taxes, or electricity costs. In fact, we observe that high *loan losses* alongside high internal *operating costs* tend to most affect the required yield. Furthermore, MFBs are operating with sub-optimal LtA ratios that leave considerable room for improvement. The fact that these issues are internally driven is a good thing. It means something can actually be done by MFBs to reduce their required yield and, in lieu, interest rates. Even in the two samples we have observed MFBs with yields below the *benchmark R*, which shows that efficiency gains are possible.

22 A short guide to calculate the APR can be found on the MFTransparency website and its use should be encouraged by the sector's stakeholders.

There is a clear need for capacity building in terms of enhancing efficiency at MFBs; for example through better delinquency control, improvements in staff productivity, etc. There is also a need for management to evaluate the current cost drivers of their institutions and determine where these efficiency gains can be found. However, it should also be recognized that MFBs in Nigeria have little incentive to lower prices even if efficiency gains are made. Thus it is also important to enable clients to compare prices; allowing them to better shop around which could improve market competition which may in turn impact pricing. This would require the implementation of an efficient and standardized disclosure regime. The present regulatory framework of CBN does require MFBs to quote their interest rates and fees on a monthly basis; but comparison is only possible if the client receives the effective price per unit. Therefore, the authors recommend introducing compulsory APR disclosure as a means to reinforce consumer protection principles with the aim of enabling clients to make informed decisions and stimulate competitive pricing in the microfinance market.

High interest rates pose significant issues to both MFBs and clients. First, they exclude a broad range of people from financial services because so long as the prices of loans remain in a range of about 100%, all investments with an annual return below 100% cannot be continuously financed through microloans. This also affects the firm as it restricts the MFBs' growth potential; narrowing their client base to individuals working in high yielding activities such as trading. High interest rates may also play a part in explaining why 40% of the population is still financially excluded[23]. It must be stressed that we are far from being able to precisely estimate the "responsible price" of microloans in Nigeria. However, we can say with confidence that a median APR of 102% and 78% for Samples 1 & 2 is beyond an acceptable range! Enhancing rational and responsible pricing practices is of special importance for the future of the MFB sector if it is to achieve its double bottom-line; being both financially sustainable and socially responsible.

23 EFINA. The Landscape of Financial Inclusion and Microfinance in Nigeria (2014). Enhanced Financial Innovation and Access.

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# 7. Annex

## 7.1. Annex I: Additional tables

| | Agricultural | | Business | | Consumption | | Unspecified | | Sum | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Declining | Flat | Declining | Flat | Declining | Flat | Declining | Flat | Declining | Flat |
| Niger | 2.5 - 5% (6) | 2.5 - 5% (5) | 3 - 9% (10) | 2.5 - 5% (7) | 3 - 5% (7) | 2.5 - 5% (5) | 6% (3) | | 2.5 - 9% (26) | 2.5 - 5% (17) |
| Ogun | 3% (1) | | 1.75 - 3% (2) | 1.75 - 6% (6) | 3% (1) | 6% (1) | 2.1 - 6% (6) | 2.1 - 3% (2) | 1.75 - 6% (10) | 1.75 - 6% (9) |
| Plateau | | | | 3.5 - 4% (2) | | 3 - 4% (3) | 4% (3) | 4% (2) | 4% (3) | 3-4% (7) |
| All | 2.5 - 5% (7) | 2.5 - 5% (5) | 1.75 - 9% (12) | 1.75 - 6% (15) | 3 - 5% (8) | 2.5 - 6% (9) | 2.1 - 6% (12) | 2.1 - 4% (4) | 1.75 - 9% (39) | 1.75 - 6% (33) |

**Table 12: Monthly nominal interest rates (number of loans in brackets)**

| | Agricultural | | Business | | Consumption | | Unspecified | | Sum | |
|---|---|---|---|---|---|---|---|---|---|---|
| | yes | no | yes | No | yes | no | yes | no | yes | no |
| Niger | 10 | 1 | 13 | 4 | 8 | 4 | 3 | 0 | 34 (79%) | 9 (21%) |
| Ogun | 0 | 1 | 4 | 4 | 0 | 2 | 2 | 6 | 6 (32%) | 13 (68%) |
| Plateau | 0 | 0 | 2 | 0 | 1 | 2 | 3 | 2 | 6 (60%) | 4 (40%) |
| All | 10 | 2 | 19 | 8 | 9 | 8 | 8 | 8 | 46 (64%) | 26 (36%) |

**Table 13: Number of loans with compulsory savings**

## 7.2. Annex II: Standardizing the cost of microloans

In order to compare the cost of different loan offerings internationally and within Nigeria, the cost needs to be expressed in a standardized format based on a uniform calculation method.

In common practice, there are three methods for comparing the cost of different loan products that are passed on to customers: the *total cost of credit*, the *effective interest rate (EIR)* and the *annual percentage rate (APR)*.

The *total cost of credit* simply adds up all payments made for a loan product by the client less the initial loan amount received without adjusting for time value of money. It is obvious that this method is not well suited for a comparison of loan products with different loan amounts and tenors. However, for more or less illiterate consumers it is a very easy option to roughly compare products with the same tenor. The following table exemplifies this:

| Product | Loan Amount and Term | Payment Schedule | Total Cost of Credit |
|---|---|---|---|
| 1 | $ 1,000 for 12 months at annual interest rate of 10% | Pay $ 1,100 after 12 months | $ 100 |
| 2 | $ 1,000 for 12 months at monthly interest rate of 1% on each month's outstanding loan balance | Pay 12 fixed monthly installments of $ 89 (principal + interest) | $ 66 |

**Table 14: Two loans compared with Total Cost of Credit**

At first glance, a consumer might determine that the total cost of Product 2 appears less than that of Product 1. However, this calculation neglects one very important fact: For the first loan, the borrower pays interest of $ 100 once on the principal of $ 1,000 at the end of the 12 months. When choosing Product 2 this is not straightforward: As the borrower pays down the principal every month, he already has less than $ 1,000 outstanding after the first month, again less after second month and so forth. This means that the total interest of $ 66 is paid on an average outstanding balance of only $ 500, which would make Product 2 already more expensive relative to the funds available than Product 2.

In contrast to the *total cost of credit*, *APR* and *EIR* take into account the actual payment profile and the time value of money. The *APR* calculates how much money is paid in every repayment period on each period's respective outstanding loan balance. Table 15 shows the calculation when taking into account that each month, interest is paid only on the outstanding balance. After one month it will be the interest on $ 921.15. The interest payment for the second month of $ 9.21 is 1% on this amount. The interest installments of 1% on the declining principal balance continue for all of the payment periods.

The *APR* then standardizes this monthly interest rate to become an annual rate by multiplying with 12, i.e. multiplying the period effective rate i, with the number of n periods per year:

$$APR = i * n$$

| Loan Cost and Cash Flow Profile | | | | |
|---|---|---|---|---|
| Principal Disbursed | Principal Paid | Principal Balance | Interest Paid | Client Cash Flow |
| 1,000.00 | | 1,000.00 | | 1,000.00 |
| | 78.85 | 921.15 | 10.00 | (88.85) |
| | 79.64 | 841.51 | 9.21 | (88.85) |
| | 80.43 | 761.08 | 8.42 | (88.85) |
| | 81.24 | 679.84 | 7.61 | (88.85) |
| | 82.05 | 597.79 | 6.80 | (88.85) |
| | 82.87 | 514.92 | 5.98 | (88.85) |
| | 83.70 | 431.22 | 5.15 | (88.85) |
| | 84.54 | 346.68 | 4.31 | (88.85) |
| | 85.38 | 261.30 | 3.47 | (88.85) |
| | 86.24 | 175.07 | 2.61 | (88.85) |
| | 87.10 | 87.97 | 1.75 | (88.85) |
| | 87.97 | - | 0.88 | (88.85) |
| 1,000.00 | 1,000.00 | | 66.19 | **(66.19)** |

**Table 15: Cash Flow Profile for Product 2**

In this case, the *APR* is thus 12%. If we look at Product 1, there is only one final interest payment of $100 which equals 10% of the loan amount. This gives an *APR* of 10%.

Thus, even if the *total cost of credit* of Product 2 is lower, its *APR* is actually higher, because in this case the interest is paid on a declining balance of the loan. While the big advantage of using *APR* is its comparability, the example above already expresses the limits of the measure: A lower *APR* does not always mean that a loan is better suited for a particular individual, since different financial situations might require different repayment schedules. The *APR* is thus only a method for expressing the effective interest that is charged on the basis of the periodic cash-flows to allow for comparability.

The example above was simplified concerning the calculation of the monthly interest rate. In repayment structures where different fees and commission are due in certain periods this is not as straightforward. However, since the *APR* uses the actual cash flows of each period to determine the periodic interest rate, all charges such as commissions and fees are included in the *APR* as they simply enter the calculation as cash costs in the period they are

due. The method of calculating the periodic interest rate in such cases is a bit more technical (for details on the calculation of the periodic interest rate see Annex IV). For purposes of illustration, we used an example without such charges, but they can easily be integrated. If e.g. an upfront commission is asked, then the actual amount disbursed to the client is lower, increasing the relative interest cost and hence the *APR* (see below).

A further method to calculate the interest cost is the *EIR*. The *EIR* takes the time value of money into consideration more comprehensively than *APR* by annualizing the period effective rate including compounding interest. Suppose there is a third loan option of paying back $ 269 every three months at a quarterly interest rate of 3%. Table 16 shows the payment schedule for this loan.

| Principal Disbursed | Principal Paid | Principal Balance | Interest Paid | Client Cash Flow |
|---|---|---|---|---|
| 1,000.00 | | 1,000.00 | | 1,000.00 |
| | 239.03 | 760.97 | 30.00 | (269.03) |
| | 246.20 | 514.78 | 22.83 | (269.03) |
| | 253.58 | 261.19 | 15.44 | (269.03) |
| | 261.19 | - | 7.84 | (269.03) |
| 1,000.00 | 1,000.00 | | 76.11 | **(76.11)** |

**Table 16: Cash Flow Profile for Product 3**

After the first quarter, $ 30 of interest is paid which corresponds to a monthly interest rate of 3%. This is done four times yielding an *APR* of 12%. So, Product 2 and this new Product 3 have the same *APR*. However, one might consider another factor: Product 2 is invoiced more frequently. How does this make a difference? With Product 3 a client holds the amount of NGN 1,000 for the first three months until he makes the first down-payment of principal and interest. For Product 2 a client holds the amount of NGN 1,000 for only one month. The interest rates on the outstanding balance are the same for both products. However, if we suppose that the client actually wants to profit from the full amount which he pays interest for throughout the entire year, he would have to re-borrow money in order to service the interest costs in each period. The *EIR* takes this into account. Accordingly, the full *EIR* of Product 2 with monthly interest payments is higher than that of Product 3 with quarterly installments. The shorter the interest calculation periods, the more frequently interest is charged upon interest. With shorter and more frequent interest cycles, we find a stronger difference between the fully compounding *EIR* and the approximate annual rate calculation using *APR*. *EIR* compounds the period effective interest rate i charged over the number of sub-annual payment periods n using the formula:

$$EIR = (1 + i)^n - 1$$

Calculating the *EIR* for Product 2 gives an interest rate of 12.7%; while the new Product 3 with quarterly repayments has an *EIR* of 12.6%. The difference is due to the fact that interest in Product 2 is invoiced more frequently than in Product 3 thus leading to a stronger compounding effect (interest-upon-interest).

The *APR* and *EIR* methods both depart from the notion of a fully compounding *period effective rate* in the sense of an internal rate of return. The internal rate of return (*IRR*) is the period interest rate which will set equal the net loan disbursement received to the present value of the subsequent cash flows payable by the client. The only difference between *APR* and *EIR* is in the way this period *IRR* is annualized: For *APR* we multiply the period *IRR* times the number of periods in a year, for *EIR* we take 1 plus *IRR* to the power of n periods minus 1. The difference between *APR* and *EIR* is small when the overall rate level is low:

A loan with a 10% p.a. nominal rate and monthly interest invoicing quoted under *APR* costs 10.00% *APR* and $(1 + (0.1/12))^{12}-1=10.47\%$ p.a. under *EIR*. When the overall rate level is as high as in microcredit, the difference between *APR* and *EIR* becomes significant. Substitute 50% for the 10% annual nominal interest rate in the previous example and you obtain an *APR* of 50% p.a. and an *EIR* of 63.21%.

*APR* is the convention in US-style consumer disclosure, while the European standard for cost of credit disclosure has long been the fully compounding annual effective rate (*EIR*). Many microfinance practitioners gravitate towards *APR*, because it flatters the politically sensitive high cost of credit, but the *EIR* is conceptually the more realistic index of the costliness of microcredit. *APR* and *EIR* aim to answer the same question: What does it cost to have use of $1 (or $1,000) for one year? With a single end-term principal payment with single interest period (also commonly referred to as bullet payments) as in Product 1, this was immediately obvious: i.e. 10%. When interest is invoiced sub-annually, a borrower would be compelled to re-borrow that interest at every invoicing interval in order to maintain use of the full principal amount. Hence, the compounding effect that characterizes the *EIR*. Now, is this sub-annual compounding realistic in micro- and consumer credit? Yes, it is! The typical working capital microloan is for less than one year and is often renewed at maturity or even settled and re-advanced early. The fact is that in microcredit permanent and growing working capital requirement are often squeezed into a weekly or monthly installment plan, thus leading to frequent re-borrowing and compounding credit costs. The same effect is evident in short-term payroll lending, where borrowers tend to roll over the same $200 every two weeks with spiraling interest cost. In the US for example, one might easily see annual *EIR* of 250% p.a. on short-term payday loans. This really means that in order to have use of $200 for a year, you paid $500 in interest. Yes, it is expensive to be poor.

Although *EIR* is the conceptually more convincing standard for cost of credit disclosure, we nonetheless opted to fall in line with the dominant practice in microfinance of using *APR* for standardizing cost of credit analyses despite its shortfalls. This makes our results for Nigeria immediately comparable with other regional and global studies of microcredit pricing.[24] A safe estimate for converting *APR* to *EIR* benchmarks assuming that most microcredit products have at least monthly interest payment intervals would be:

$$EIR = (1 + \frac{APR}{12})^{12} - 1$$

## What to include in the APR?[25]

The examples above were very much simplified, as they only included interest charges. In practice however, different fees, commissions and deductions must be taken into account. As the *APR* is calculated on the basis of periodic net cash flows, this can easily be integrated. For this purpose, all fees and charges must be included in the calculation as per their actual due dates.

In Nigeria several different ways of adding costs are commonly practiced:

### Flat interest & declining balance interest

The nominal interest rate is the interest rate (either monthly or annually) that is commonly stated to the clients. There are two types of nominal interest. The interest can be either charged on a declining balance or as a "flat interest". If the interest is charged on a declining balance basis, interest is charged only for the loan amount outstanding. Flat interest, however, is charged on the original loan balance and remains the same during the entire loan tenor, even though the client does no longer have use of the full principal amount at disposal. This practice is very common within the Nigerian microfinance sector. It allows MFBs to realize higher interest earnings given a lower stated nominal interest. A rule of thumb says that flat interest is nearly twice as much as the interest based on the declining balance for the same nominal interest figure.

### Further compulsories

*APR* should also include all compulsories. Compulsories are dues that the client has to pay. They include fees and commissions for the loan approval. Nigerian microfinance features sometimes high and wide ranging fees and commissions: Administration fees, application fees, risk fees, monitoring fees, assorted commissions and other charges are common within

24 Especially MFTransparency is pioneering on the development of a database of APRs and EIR. MFTransparency also developed a free Excel-based tool to calculate the APR and EIR, which was used for all calculations of this paper. Even though the tools state both figures, their flagship indicator, the Transparent Pricing Index, is based on the indicator APR. Moreover the qualitative assessments in the country reports published by MFTransparency are based the APR as an indicator.

25 All different compulsories named in this chapter are included in the EIR using the same principles.

the sector. Value added tax (VAT) and loan insurance would also be considered compulsories, but both do not occur within the Nigerian microfinance sector as far as observed.

Another cost factor is the controversial method of compulsory savings. Often clients have to deposit a certain percentage of their loan amount upfront as a security at the MFB. They cannot access the savings during the loan period. Compulsory savings impact the net cash balance available for business use, as these funds are not at the client's disposal. This means that clients pay interest on an amount of money they never had use of. Many MFBs do not even pay interest on the client's compulsory savings.

### Grace periods & frequency of repayments

Granting a grace period and the frequency of repayment are other factors that influence the real price of a loan. A grace period is a timeframe – usually at the beginning of a loan disbursement – during which neither down payments on the principal nor interest have to be repaid. This allows the client to hold the whole loan amount for a longer time which increases the average loan balance and reduces *APR*. The frequency of installments (i.e. the frequency of interest invoicing) is a factor which affects the *EIR* only as we saw above. It is thus not important for the further calculations, however, for completion it shall be mentioned here. In general terms, it is advantageous for MFBs to demand interest and principal payments frequently as a way to maintain contact with the client and manage risk. Clients in contrary prefer fewer installments and longer grace periods, allowing them longer use of the funds for business purposes.

## 7.3. Annex III: Methodology of calculating different Rs

This section will specify in more detail how the different components of the formula

$$R + \frac{II}{1 - LL} = \frac{AE + LL + CF + P}{1 - LL}$$

were calculated.

All values were taken from the balance sheets according to CBN standards and are presented in bold and italics here to mark the distinction to the indicators as named by the authors.

### Administrative Expenses (AE)

The *administrative expense ratio* was calculated as the *total operating expenses* divided by the ***Total Loans and Advances/Leases.***

### Loan loss ratio (LL)

The *loan loss ratio* was calculated as the loans classified as *Lost* divided by the ***Total Loans and Advances/Leases***. Loans are classified as *Lost* are those loans that are outstanding for more than 90 days.

### Cost of funds rate (CF)

The *cost of funds rate* was calculated using the following assumptions:

| | |
|---|---|
| Interest on deposit liabilities | 3% |
| Interest on other current liabilities | 15% |

**Table 17: Assumptions for calculating the cost of funds rate**

These rates were multiplied with their respective balance sheet item:

For *deposit liabilities* the ***Total Deposits*** from the balance sheet was used. *Other Current Liabilities* were calculated as ***Total Current Liabilities*** minus the ***Total Deposits***. Each of these values were multiplied with their respective interest rate (see table 17) and their sum was calculated. The resulting value was divided by the ***Total Loans and Advances***.

### Profit Margin (P)

The *profit margin* was calculated on the grounds of the assumed *desired pre-tax return on equity* of 30%.

| | |
|---|---|
| Desired pre-tax return on equity | 30% |

**Table 18: Assumption used for calculating the capitalization rate**

First, the ratio of ***Total Loans and Advances/Leases*** was divided by the ***Total Capital and Reserves***. The resulting value signifies which percentage the loan portfolio represents in relation to equity. The 30% were then divided by the fraction of the loan portfolio to equity.

All these values were divided by 1-LL and then summed up. The methodology above was used to calculate the *total actual R*. Several specifications of these values were necessary for the calculation of the *portfolio adjusted R* and the *benchmark R*:

### Portfolio adjusted R

The calculation of the *loan loss ratio* was not changed for calculating the *portfolio adjusted R*. For all other values a corrective value was introduced. In line with assuming a balance sheet structure in which the loan portfolio equals 67% of total assets and the remaining assets equal 33% it was calculated as **(*Total Loans and Advances/Leases* * (1+(33%/67%))/*Total Assets***. If this factor exceeded 100% it was normed at 100%.

This factor was included in the calculation of the *portfolio adjusted R* by multiplying it with the numerator of the *cost of funds*, the *administrative expense rate* and the *profit margin*.

### Benchmark R

The *benchmark R* was calculated using the following benchmarks (see chapter 5. for a justification of the benchmarks):

| | |
|---|---|
| Loan loss rate | 3.5% |
| Administrative expense ratio | 12% |
| Loan to asset ratio | 67% |

**Table 19: Assumptions used for calculating the *benchmark R* taken from Hoback (2013)**

The *loan loss ratio* and the *administrative expense ratio* for calculating the *benchmark R* were merely taken from the table. The numerator of the *cost of funds rate* and the *capitalization rate* were not change for this task, however, both were not divided by the ***Total Loans and Advances/Leases*** as was done before. Instead a portfolio size was calculated that fulfills the condition being 67% of all assets. The denominator used for the two values was thus changed and calculated by multiplying 67% with the ***Total Assets*** of the balance sheets.

### APR

The *APRs* for all loan products were calculated using the MFTransparency toolkit. For calculating the *APR* for MFBs, the average *APR* of all known loan products of the MFB was calculated (more details in Annex V).

The following section will show a graphical display of the results of this exercise for each individual MFB.

## 7.4. Annex III: R calculations for individual MFBs

The following figures represent the results of calculating the different required yields on the loan portfolio for each individual MFB. Several things must be specified: the first figure is presented on a different scaling since the values are much higher than for the rest of the banks. Moreover it must be stressed again that the values represented in the graph are **not** the true percentage values of the cost factors as each value is divided by 1-LL. The bar graph sums up all values on the right side of the equation below.

$$R + \frac{II}{1 - LL} = \frac{AE}{1 - LL} + \frac{LL}{1 - LL} + \frac{CF}{1 - LL} + \frac{P}{1 - LL}$$

Thus the percentage values of the different cost-factors in the graph are most of the times only slightly bigger than the actual cost ratio. There are some notable exceptions, if the *loan loss* is very high. The MFB that is represented in the second figure e.g. has a *loan loss ratio* of 48% of the loan portfolio. Thus e.g. the fraction LL/(1-LL) equals 92% which is in fact far higher than the actual *loan loss rate*. The reason why this portrayal is necessary is that otherwise it could not be compared to the actual *APR* charged. The *APR* charged only generates income on loans that do not default. It is thus higher than just the sum of all cost-factors

as it must be generated on the performing portfolio. This must be taken into account when estimating the required yield.

## 7.5. Annex IV: Calculating of the periodic interest rate or "Internal Rate of Return"

In addition to the explanations in the text the following paragraph will deliver a more technical insight of how the periodic interest rate is calculated. The *APR* and the *EIR* are means to combine all costs the client pays in the contract (interest, fees, insurance, taxes) plus the hidden costs (compulsory savings) and convert it into a simple, declining balance interest rate. Both *APR* and *EIR* are defined as the interest rate that would make the present value of the loan received by the client equal to the present value of the installments paid by the client. The discount rate method as shown below is used to calculate this:

$$\sum_{k=1}^{n} \frac{A_k}{(i+1)^k} = \sum_{k=1}^{n} \frac{P_k}{(1+i)^k}$$

Where:

$A_K$: amount of advance in $k^{th}$ period

k: period number

n: number of periods

$P_K$: amount of payment in $k^{th}$ period

i: percentage rate of finance charge per period

Various toolkits for calculating effective interest rates (i.e. by MFTransparency or Deutsche Bank[26]) use the Discount Rate to calculate this *Internal Rate of Return* (*IRR*). The *IRR* takes the cash flow of the loan payments and returns the per-period interest rate. This is the effective interest rate for each of the periods of the loan term, if the periods are even.

## 7.6. Annex V: Calculating the weighted average APR for all MFBs

The MFBs participating in the questionnaire were asked to give details on the outstanding amount of each loan product as of December 2012. Of the sixteen MFBs which are part of the calculations for Chapter 5.4., twelve MFBs provided this data. For all except two MFBs there is reliable data on the amount of total loans outstanding as of December 2012. Thus, we could calculate whether the loan products of the sample are representative for the whole loan portfolio for ten MFBs and we could calculate the weighted average for twelve MFBs.

The share of the loans in our sample out of the total loans outstanding are listed in Table 20.

26 http://www.microfinancegateway.org/p/site/m/template.rc/1.9.47455/

| MFB | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total loans in sample/Total loan portfolio | 73% | 84% | 100% | 100% | 100% | 100% | 100% | 100% | 101% | 103% | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |

**Table 20: Share of loans in sample of total loan portfolio for all MFBs**

The amounts greater than 100% are presumably due to the fact that MFBs sent in data of the time when filling out the questionnaire which was later than December 2012. Thus the total portfolio might have grown in the meantime. An alternative explanation could be that the amounts outstanding of each loan product are usually only monitored for internal controlling purposes whilst we used the official published data for the total loan portfolio taken from the mandatory return sheets. Since MFBs do not always follow the regulatory standards for monitoring loan loss the difference could be due to different practices of depreciation.

The weighted average was calculated by multiplying the share each loan product takes up of the portfolio with the *APR* of that product for each MFB. Then the sum of these values was calculated for each MFB. For the four banks where no detailed data was available the unweighted average was taken.

Moreover it must be specified that some MFBs reported loan products with different repayment structures which altered the *APR*. However for this one loan product with different repayment schedules only one figure of the loans outstanding of this product was available even though they are actually two products. In this case the unweighted average was taken for these two products and this unweighted average *APR* was weighted against the remaining products of that respective MFB. An example might clarify this. Suppose one MFB reported two loan products: Product A which takes up 40% of the total loan portfolio and Product B which takes up 60% of the total loan portfolio. Now suppose Product A is presented with two different repayment structures (Product A.1 and Product A.2), which slightly alter the *APR*. In this case the weighted average would be calculated as:

$$Weighted\ Average\ APR = 40\%\ x\ \frac{APR\ of\ \ product\ A.1 + APR\ of\ \ product\ A.2}{2} + 60\%\ x\ APR\ of\ \ product\ B$$

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