Department für Agrarökonomie und Rurale Entwicklung
Georg-August Universität Göttingen

April
2014

Diskussionspapiere

Discussion papers

How flexible repayment schedules affect credit risk in agricultural microfinance

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ISSN 1865-2697

Diskussionsbeitrag 1404

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How flexible repayment schedules affect credit risk in agricultural microfinance

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Abstract

Using a unique dataset of a commercial microfinance institution in Madagascar, this paper investigates how the provision of microfinance loans with (in)flexible repayment schedules affects loan delinquencies of agricultural borrowers. Flexible repayment schedules allow a redistribution of principal payments during periods with low agricultural returns to periods when agricultural returns are high. We develop a theoretical framework and apply and estimate an econometric model for the loan repayment behavior of agricultural micro-borrowers with seasonal and non-seasonal production types. Our results reveal that delinquencies of non-seasonal farmers and seasonal farmers with inflexible repayment schedules are not significantly different from those of non-farmers. Furthermore, we find that seasonal farmers with flexible repayment schedules show significantly higher delinquencies than non-farmers in low delinquency categories, but we also find that this effect disappears in the highest delinquency category.

Keywords: Agricultural Credit, Borrowing, Financial Risk, Loan Repayment, Microfinance, Seasonality

JEL Codes: G21, G32, Q14

Highlights :

- Development and application of a theoretical framework which takes into account seasonality induced incongruence of cash flows and repayment obligations of microfinance borrowers.
- Investigation whether flexible repayment schedules of microfinance loans affect credit risk of agricultural borrowers.
- Inflexible repayment schedules are adequate for agricultural borrowers with non-seasonal production types.
- Flexible repayment schedules affect loan delinquencies of seasonal agricultural borrowers differently.

Introduction

Lending techniques applied by microfinance institutions (MFIs) are adequate to reflect the business conditions of many micro, small, and medium enterprises (MSMEs). Loan sizes are adapted to the borrowers' incomes based on intensive client assessments, relationships are established by carefully increasing loan amounts for good borrowers, and loan products are standardized by offering mainly annuity loans with loan repayment starting immediately after loan disbursement (namely standard loans). Product standardization is even considered as one of the main reasons for the high repayment rates and, hence, the success of microfinance (Armendáriz de Aghion and Morduch, 2000; Jain and Mansuri, 2003). But product standardization also has several drawbacks.

When repayment schedules cannot be harmonized with the occurrence of investment returns, the number of potential projects that can be realized is limited. In order for a project to be financed, fast turnovers and regular cash flows of nearly the same level are required. In particular, longer term projects need time to mature before they generate returns sufficiently high enough to repay loan installments. In consequence, profitable investments might not even be realized due to mismatches between cash flow and repayment obligations (Field et al., 2010). Most MFI clients are, hence, traders, using their loans to finance working capital, but the share of loans for long-term projects, however, remains low (Dalla Pellegrina, 2011).

Moreover, while microfinance has reached many urban entrepreneurs, there are still important deficits in serving MSMEs in rural areas, particularly for entrepreneurs in the agricultural sector (Llanto, 2007; Hermes et al., 2011). Most agricultural production types are characterized by a high level of seasonality leading to mismatches between expenditures during planting season and revenues at the time of harvest (Binswanger and Rosenzweig, 1986). Especially here, standard loans with inflexible repayment schedules, which cannot account for seasonal cash-flow patterns of agricultural producers, seem to be significant.

The provisioning of microfinance loans with flexible repayment schedules (namely flex loans) is, hence, stipulated by the literature (e.g., Meyer, 2002; Llanto, 2007; Dalla Pellegrina, 2011; Weber and Musshoff, 2013). Nonetheless, despite the potential of flex loans to increase the outreach of MFIs, most MFIs are still reluctant to make repayment schedules more flexible. They might fear that repayment schedule flexibility jeopardizes repayment quality. However, there is no empirical evidence that could support this concern.

Therefore, the objective of this paper is to provide first empirical evidence how the provisioning of flex loans affects loan delinquencies of agricultural MFI borrowers. In order

to do so, we will first develop a theoretic loan repayment model in which the loan repayment probability depends also on the congruence of cash flows and repayment obligations. Based on this model, we will present and apply an econometric model to a unique data set provided by an MFI in Madagascar. The repayment function of the econometric model is estimated by different Tobit models for three different loan delinquency categories. Thereby, we account for agricultural and non-agricultural micro-loan contracts.

To our knowledge, we are the first to investigate the effects of repayment schedule flexibility on loan delinquencies in general and for agricultural firms in particular. Our findings will, thus, provide evidence whether the benefits of flexible repayment schedules are diminished by higher credit risk. Moreover, as flex loans are seen as a prerequisite for the financial inclusion of agricultural firms, our findings for loan delinquencies will allow for conclusions whether their financial inclusion will be sustainable.

The rest of this paper is organized as follows: In the second part, we will provide a brief overview about the motivation for different lending principles currently applied in microfinance and how these principles determine the projects financed by MFIs in developing countries. In the third part, we will present our theoretical framework. This leads us to our research hypotheses. In the fourth part, the investigated MFI, data, and the econometric model are discussed. After the discussion of the results in the fifth part, the paper ends with conclusions and suggestions for further research.

Literature Review

The impacts of microfinance on MSMEs in developing countries are currently controversially discussed. Microfinance has achieved the financial inclusion of millions of micro, small, and medium entrepreneurs that previously had no access to financial services (Love and Peria, 2012). But after only thirty years since the foundation of the first Grameen Bank, there are already signs of microcredit over-supply and even borrower over-indebtedness, especially in emerging countries (Vogelgesang, 2003; Taylor, 2011). However, the contribution of microfinance to investment stimulation, employment generation, and economic development is less controversial (Duvendack et al., 2011; Pande et al., 2012).

In 1983, the Grameen Bank started its operation in Bangladesh, applying a new cash-flow based group lending technique to address MSMEs that were considered too risky by existing conventional banks. Compared to conventional banking, group lending does not require the borrower to provide economically meaningful collateral as it transfers loan repayment obligations to a group of borrowers. The joint liability of the borrower group also overcomes

adverse selection, moral hazard, and contract enforcement problems which, in consequence, led to high loan repayment rates (Armendáriz de Aghion and Morduch, 2000). However, group lending reaches its limitations in sparsely populated rural areas. Here, social ties among people might be strong, but participating in group meetings on a regular basis is time consuming and costly for the members. Also, in cities where people rarely know each other, group lending is less adequate (Armendáriz de Aghion and Morduch, 2000). On the contrary, in urban areas the economic activity and, hence, the demand for credit is high. In order to overcome these limitations, the individual lending approach was introduced in microfinance. This approach combines the cash-flow based lending technique of group lending and the individual liability principle of conventional banking (Armendáriz de Aghion and Morduch, 2010). Driven by the support of donors, development finance institutions, and commercial banks, individual lending MFIs can be found all over the world today, although mainly in urban areas (Llanto, 2007).

One of the main reasons for the success of MFIs is the provisioning of standard loans. Standard loans are widely used by group lending and individual lending MFIs. Despite the fact that repayment installments of standard loans are adapted to the income of the borrower, including the cash flow of the financed project and other income sources of the borrower's household (Armendáriz de Aghion and Morduch, 2010), repayment schedules of standard loans cannot be harmonized with the cash flow occurrence of the borrower. Thus, standard loans might be adequate for businesses generating fast returns on a regular basis, e.g., petty traders (Llanto, 2007). Especially for longer-term projects, standard loans seem counterintuitive as such projects need time to mature before first returns are realized. Only if an entrepreneur is able to smooth temporary cash-flow shortfalls of the financed project by other income sources can the project be financed. In consequence, profitable projects cannot be realized at all, or only with higher repayment risks, when cash flow and repayment obligations do not match (Field et al., 2010). Hence, product standardization might reduce default risks for clients with continuous cash flows but limit the focus of MFIs to projects fulfilling the product requirements (Weber and Musshoff, 2012). Unsurprisingly, most MFI clients are traders with fast turnovers, using their loans to mainly finance working capital. The share of long-term loans offered by MFIs remains low, especially loans to entrepreneurs with seasonal returns typically found in the agricultural sector (Dalla Pellegrina, 2011).

Agricultural production is often characterized by a high level of seasonality which frequently leads to periodical imbalances between expenditures in the planting and revenues in the harvesting seasons (Binswanger and Rosenzweig, 1986). For this reason, loans with flexible

loan repayment schedules harmonized with agricultural production cycles are often stipulated in the agricultural economics literature (Meyer, 2002; Dalla Pellegrina, 2011; Weber and Musshoff, 2013). In this context, Meyer (2002) argues that firms in Bangladesh with significant agricultural income would be better served with loan repayment schedules matching expected cash flows and shifting principal repayment to the time of harvest. Also, Dalla Pellegrina (2011) states that compared to (flexible) loans of informal money lenders and conventional banks, standard loans of MFIs are less suitable to finance agricultural projects. Weber and Musshoff (2012) find in their MFI analysis in Tanzania that standard loans might be the reason why agricultural firms have lower credit access probabilities than non-agricultural firms. The absence of adequate loan products for agricultural firms is, hence, considered to be one reason why the penetration of agricultural clients by MFIs is still low (Christen and Pearce, 2005; Llanto, 2007).

In addition to inadequate loan products, the outreach of MFIs to rural areas where most of the agricultural production takes place is constrained by higher operational costs when compared to urban areas. The reason is that distances between customers and MFIs are larger and population densities are lower, making it more time and fuel consuming for banks to approach and to monitor borrowers (Caudill et al., 2009; Armendáriz de Aghion and Morduch, 2010). Collection costs are considered to be one of the largest operational cost components in microfinance (Shankar, 2007). Reducing the number of repayment installments by providing flex loans could contribute to reduced operational costs, specifically collection costs. This might lead to efficiency gains for MFIs. Similar to advanced banking technologies, such as mobile phone banking (Hermes et al., 2011), this will ultimately lead to lower interest rates for the borrower in a competitive market. Gaining efficiency is especially relevant when MFIs operate in saturated markets or intend to approach new market segments associated with higher operational costs (Caudill et al., 2009). Rather than increasing efficiency by disbursing larger loans sizes, an attempt that recently has been criticized for causing a mission-drift of MFIs from poor towards wealthier borrowers (Hermes et al., 2011), the reduction of operational costs allows MFIs to approach new market segments (Caudill et al., 2009) and to finance projects with lower returns (Armendáriz de Aghion and Morduch, 2010).

Despite the potential of flexible repayment schedules to increase the efficiency and outreach of MFIs, most MFIs are still reluctant to make repayment schedules more flexible. They might fear that more flexibility reduces repayment quality (Jain and Mansuri, 2003). However, there is no empirical evidence that could support this concern. Most research focusing on the effects of flexible repayment schedules on loan repayment is based on

experiments, and the results are mixed. In a field experiment in India, Field and Pande (2008) randomly assigned microfinance loans to mostly non-agricultural borrowing groups of a MFI with either monthly or weekly repayment installments. They find that different repayment schedules have no significant influence on loan delinquencies. In a later experiment with borrowers of the same MFI, Field et al. (2010) complement their first investigations by analyzing the effect of a two-month grace period[4] on loan delinquencies of non-agricultural borrowers. They find higher loan delinquencies for loans with grace periods. However, despite their randomization, the granting of grace periods was arbitrary and did not depend on the underlying cash-flow patterns of the borrowers. Hence, they were not able to control whether the investigated borrowers needed the grace period to compensate cash-flow induced liquidity shortfalls. In a similar experiment with randomly assigned loans to borrowing groups in India, Czura et al. (2011) tried to extend the earlier research and implicitly addressed potential cash-flow shortfalls of the borrowers. Therefore, they only focused on dairy farmers. This was motivated by the purpose of loan use. All borrowers in their experiment used the loans to buy lactating dairy cows, i.e., cows that were giving milk at the time of purchase but that would stop giving milk for two months after the lactation phase. This event was expected to occur a certain time after loan disbursement, and, hence, the borrower would suffer a cash-flow shortfall at that moment. Czura et al. (2011) assigned different loan types to the borrowers: standard loans, loans with pre-defined grace periods, and loans with flexible grace periods where the borrower was allowed to postpone up to two repayment installments at any time three months after loan disbursement[5]. Their results show that loan delinquencies of loans with flexible grace periods were not different from those of standard loans. Their experimental results for the effect of grace periods are also supported by Godquin (2004), who investigates the loan repayment behavior of MFI borrowers in Bangladesh, finding that loans with grace periods have significantly lower loan delinquencies than standard loans. These findings suggest that switching from standard loans to flex loans may not necessarily affect repayment quality. Moreover, these findings support the argument that decreasing the number of repayment installments bears the potential to increase the efficiency of MFIs, as flex loans are not associated with higher loan defaults.

[4] During a grace period the borrower only needs to partly fulfill his repayment obligations (principal, interests). The graced repayment obligations are postponed to the future, usually when returns occur.

[5] Given the monthly repayment plans, the postponement of two installments is similar to a two-month grace period. Two months is the average resting phase of a dairy cow between two lactation periods. During the resting phase the cow produces no milk and, hence, generates only costs and no returns.

Theoretical Framework and Hypotheses

Consider a farmer who has a real investment project available with a vector of cash flows represented by π which occur over T periods. The farmer has access to a credit contract represented by a vector of loan installments R (including principal and interest payments). The schedule of payment streams represented by π is not necessarily congruent with the one represented by R, so that the possibility of a matching problem arises. Together with a discount rate δ, the payment streams define the present value of the investment project:

$$K = K(\pi, R, \delta), \tag{1}$$

where $K = \sum_{t=0}^{T}(\pi_t - R_t)(1+\delta)^{-t}$ and subscripts t denote the payment streams in period t.

We follow the literature in making the simplifying assumption that K is either realized in full with probability p, or it completely fails ($K = 0$) with probability $1 - p$. Following Armendáriz de Aghion and Morduch (2000), we further assume that the farmer has full control over the success probability p. This can also be interpreted as the effort level exerted by the farmer and thus introduces the possibility of moral hazard to the model. Given the credit contract represented by R, the borrower makes his effort choices, after which the array of returns is realized, and the project either succeeds or the farmer defaults on the loan.

To increase repayment incentives for the borrower, the credit contract also includes the pledge of a material or social collateral, W, which the farmer loses in case of default. Moreover, effort comes with a cost,

$$c(p) = C\frac{p^2}{2}, \tag{2}$$

where C is a fixed cost component and the quadratic form implies an increasing marginal cost of effort. The farmer controls p by solving the following ex-ante maximization problem:

$$\max_p \; pK + (1-p)(-W) - c(p). \tag{3}$$

Given the choice of an effort level, the farmer knows that project returns materialize with a probability p, he loses his collateral with probability $1 - p$, and the cost of effort accrues with certainty.

The first order condition of this problem reads:

$$K + W = pC. \tag{4}$$

The farmer, hence, balances the return from the project plus the value of the collateral against the marginal cost of effort. This condition yields the following repayment function:

$$p = \frac{K(\pi,R,\delta)+W}{C}. \quad (5)$$

According to this model, the repayment probability is increasing in K and W and decreasing in C. Note that K is, in turn, dependent on the congruence of π and R.

In the following, we attempt to estimate (5) by using credit contract data from Madagascar. Of particular interest are the repayment characteristics of the loan contracts which influence the distribution of R and thus the level of K. In particular, we distinguish the three main types of repayment schedules offered: standard, flex without grace periods, and flex with grace periods. Other borrower characteristics from the contract data are included to proxy for π, δ, π, δ, W, and C. The repayment probability is measured by three different delinquency categories, which are explained in detail in the next section.

Taking into account the attributes of standard and flex loans and the findings in the experimental literature for the effects of flexible repayment schedules on loan repayment for firms with cyclical cash flows, our hypotheses (H) are the following:

H1 "Farmer Standard": The credit risk of farmers with *standard loans* is not different from those of non-farmers with standard loans.

H2 "Farmer Flex": The credit risk of farmers with *flex loans without grace periods* is not different from those of non-farmers with standard loans.

H3 "Farmer Flex Grace Period": The credit risk of farmers with *flex loans with grace periods* is not different from those of non-farmers with standard loans.

Investigated MFI, Data, and Econometric Model

Investigated MFI

The MFI investigated in this paper is Accès Banque Madagascar (ABM), a commercial MFI with a special focus on MSMEs, operating as a fully-fledged commercial bank and owned by its founders[6]. ABM was founded in 2007 and now offers its services through 17 branch offices in Madagascar, disbursing all loans in local currency, Madagascar-Ariary (MGA). The branch network of ABM reaches far beyond the capital, Antananarivo, where ABM began its business. During the spring of 2013, the authors undertook extended field visits to different

[6] Access Microfinance Holding AG, BFV-Société Générale, KfW, IFC, Triodos-Doen Fund.

branch offices of ABM where standard loans and flex loans are offered. The procedures of the bank are specially designed and only allow for disbursing individual loans. No group loans are offered. At the moment, there are six different business loan products in the micro segment: standard loans, housing loans, emergency loans for unforeseen private expenditures (e.g., accidents), flex loans with/without grace periods, warehouse receipt loans[7], and value chain loans in cooperation with an input supplier[8]. Besides loans, the bank offers different types of deposits and money transfer services.

The loan granting process of ABM is typical for commercial MFIs involved in individual lending and is similar to other banks of the Access Microfinance Holding AG. In addition to intensive on-site client assessments, this includes the verification of investigated information and securities through cross-checks carried out by the loan officer and a decentralized loan decision on the branch office level through a credit committee. The whole assessment approach allows for the reduction of information asymmetries for the bank to a large extent which, apart from the cash-flow based approach, is one of the core principles of microfinance (Armendáriz de Aghion and Morduch, 2000 and 2010).

In Madagascar, about 70% of the total population (most of it living in rural areas) is employed in the agricultural sector, and the mainly small scale agricultural sector contributes about 30% to the country's GDP, after the (mainly informal) services and (mining) industries sectors. Hence, for ABM to successfully reach small entrepreneurs in rural areas it has to ultimately acknowledge agricultural production circumstances and simultaneously consider the local specifics in the microfinance sector. Our field studies reveal that the competition in Madagascar's formal microfinance sector can generally be considered as high for urban areas and moderate for rural areas. In rural areas, most of ABM's flex loans are disbursed. There are two competitors for ABM in agricultural lending that offer similar products. ABM introduced flex loans four years after its foundation but only in selected branch offices in rural areas. In this attempt, standard loans had to be adapted. Except for animal producers and dairy farmers, all farmers are considered as seasonal by the bank. Seasonal agricultural loan applicants with more than 50 % of their income generated through agricultural production

[7] ABM owns the warehouses and takes stocks of crops (currently only rice) from farmers (at market prices) as loan collateral. During the loan repayment period, the stock can be reduced according to the changing collateral requirements. ABM charges the client with a stock depositing fee. Besides getting the stock as collateral accepted, the farmer benefits from increasing crop prices after the harvesting season.

[8] ABM cooperates with an input supplier for poultry production. If a loan applicant fulfills the requirements to raise a high-yield poultry breed, he will use the loan from ABM to buy a full package to raise these chickens from the input supplier (chicken, vaccination, feed). Thus, the farmer generates higher returns through a better chicken breed, and the bank reduces its risk that the client's business will work out unsuccessfully.

receive a flex loan. The loan applicant cannot decide which loan type he will receive; this decision is made by the bank ex-ante, i.e., before the loan assessment takes place. The reason is that flex loans can only be assessed by special agricultural loan officers of ABM.

The main difference between standard loans and flex loans during the loan assessment is how future cash flows of the client are considered to determine the client's repayment capacity, i.e., the amount the client is able to use for loan repayment per month as loans of ABM must be repaid on a monthly basis. Typically for standard loans, the cash flows of the client during a given period before the loan application are expected to also occur in the future. This is the standard approach in microfinance. The repayment capacity is calculated on the average monthly cash flow minus all the client's private expenditures reduced by 30% to allow covering unforeseeable expenses (e.g., accidents). For flex loans, the transfer of past cash flows would be misleading as most farmers (despite the high seasonality of expenditures and returns) usually rotate crops year by year. Furthermore, commodity prices vary. Thus, the responsible loan officer structures a cash flow calendar by evaluating not only plantation and harvesting periods but also all related costs and returns of an agricultural activity on a monthly basis. Because most farmers' agricultural activities are diversified, this needs to be done for all agricultural activities of the farmer. As most farmers also have income from non-agricultural sources, these sources also need to be considered. The higher a seasonal farmer is diversified, the less likely it is he will c.p. face months with negative cash flows and, hence, negative repayment capacities. Nevertheless, flex loans allow for granting grace periods for months with negative cash flows.

ABM grace periods are defined by months with loan repayments below the annuity that would be due with the application of a standard loan. There are also possible consecutive grace periods, and cash-flow analyses are verified by credit committee members for each loan on the branch level. One further difference to standard loans is the frequency and the purpose of client visits after loan disbursement. While with standard loans only one visit is foreseen to keep in contact with the client before the first repayment installment (for standard loans typically one month after disbursement), one additional visit takes place with flex loans. The purpose of these visits is to verify that the loan was used to finance the intended activity. The reason for this verification is that for the cash-flow estimation the returns of the financed activity were considered, and a deviation (e.g., when the farmer plants another crop) increases the probability that the client runs into repayment problems. The decision whether a farmer is granted a grace period is made by the bank and is based on the underlying cash-flow patterns of the farmer. It is also possible to grant grace periods for standard loans in exceptional cases.

The expert interviews conducted during our field visits reveal that despite ABM's additional efforts for flex loans, the costs of flex loans are only 4-6% higher when compared to standard loans. This leads to only slightly higher interest rates for flex loans.

Data

Our dataset comprises all micro loans (standard loans and flex loans) that ABM has disbursed between February 2007 (the first month of operation) and December 2012, the month we received our data from the bank. Our data were extracted from the Management Information System (MIS) of the bank and includes loan and respective client data. The loan data (e.g. disbursed loan amounts, disbursement dates, branch office numbers) are generated automatically by the MIS as soon as a loan is disbursed. The client data, which are generated through the client assessments by the loan officers, are entered manually into the MIS and have to be cleaned for obvious data entering errors and outliers. After the data cleaning process, the remaining population consists of 80,519 disbursed working capital and investment loans, including 2,790 loans to agricultural entrepreneurs disbursed as standard loans and 2,928 disbursed as flex loans.

The descriptive statistics of micro-borrowers of ABM are provided in Table 1, along different client groups, and in Table 2, along three different delinquency categories. The three delinquency categories measure the number of loan installments a client failed to pay for more than 1, 15, and 30 days when due, respectively. These categories are derived from the portfolio at risk (PAR) measure applied in banking for monitoring loan portfolio risk on a daily basis. The PAR indicates the share of loans which are overdue by a certain number of days from the moment the loan portfolio analysis is carried out. The limitation of the PAR measure is its validity, limited strictly to the moment when the loan portfolio is analyzed. For this reason, the categories we apply take the frequency of loan delinquencies over the whole loan maturity into account[9]. Consequently, our delinquency categories I, II, and III indicate increasing credit risk, whereas the third, the number of loan installments that were missed by 30 days or more, indicates the highest credit risk[10].

[Insert Table 1 about here]

[9] Alternatively, we could investigate the probability that a loan is overdue once for a certain number of days, but such an analysis could not explore all the repayment information available.

[10] As soon as a loan is overdue for 30 days or more, the bank has to reserve loan loss provisions, resulting in effective costs on the profit and loss statement until the installment is paid. These costs are additional to those caused by higher administrative efforts.

In Table 1 the mean comparison tests (t-test) between agricultural and non-agricultural clients with standard loans/flex loans and non-agricultural clients reveal that *loan delinquencies* in ABM are significantly different between farmers with standard/flex loans and non-farmers with standard loans. This finding is consistent over all of our three delinquency measures. Moreover, farmers with flex loans show the lowest delinquency levels. Taking into account that most of the farmers with flex loans have seasonal production types (e.g. crop production), the mean comparison tests imply the lowest credit risk for seasonal agricultural producers. Table 1 further reveals large *business income* disparities between farmers and non-farmers, here with seasonal producers having only about 15% of the *business income* of non-farmers. This might be explained to a large extent by the geographical distribution of ABM clients. The five branch offices of ABM currently offering flex loans are situated in rural and semi-rural areas where incomes are generally lower than in urban areas. The income differences might also explain why *disbursed loan amounts* are lower for farmers, especially farmers with seasonal production types. With the exception of branch office number five, it is obvious that there is no strong regional focus for standard loans disbursed to farmers. Furthermore, the *gender* distribution is interesting, where our data reveal a male-dominated agricultural sector and a female dominated non-agricultural sector. Also, agricultural clients with flex loans have much more *work experience* than non-farmers. On the other hand, the group of farmers with flex loans reveals a much lower share of *repeat clients*, i.e., clients who received a loan from ABM before, which is not surprising because flex loans were only introduced in ABM at the end of 2010.

[Insert Table 2 about here]

In Table 2, the descriptive statistics are provided along our three delinquency categories and account only for delinquent loans. The number of observations, reported at the bottom of Table 2, indicates a declining number of loans with delinquencies from the first to the third delinquency category. The distribution amongst different client groups reveals that most loans with delinquencies are standard loans disbursed to non-farmers (given the large share of this client group in Table 1, this is not surprising). Moreover, our data reveal that the share of this group increases from the first to the third delinquency category. Furthermore, the distribution of the *fixed assets*, *business income*, *business expenses*, and the *disbursed loan amount* is remarkable. Here, the data shows the lowest mean value of *fixed assets* and, hence, physical collateral in the highest delinquency category. Vice versa, the highest mean value of *business income, business expenses,* and consequently *disbursed loan amounts* can be found in the third delinquency category. Furthermore, more clients in the highest risk category are

younger, female, unmarried, live in smaller families, have less *work experience*, and as the variables *deposit* and *repeat client* reveal, have weaker relationships with ABM than in delinquency categories I and II. Our data, furthermore, shows an increasing number of loans with delinquencies over time in all three risk categories, which mainly indicates ABM's loan portfolio growth rather than annual differences in credit risk. The same accounts for the distribution of delinquent loan installments among the 17 different branch offices.

Econometric Model

The econometric model for the repayment function (5) is the following:

$$D_{i,t} = \alpha + \beta^{b} \cdot as_i + \beta^{d} \cdot asg_i + \beta^{h} \cdot af_i + \beta^{l} \cdot afg_i + \beta^{m} \cdot nsg_i + \beta^{n} \cdot nf_i + \beta^{o} \cdot nfg_i + \boldsymbol{\gamma} \cdot \mathbf{x}_{i,t} + Y_t + \mathbf{u} \cdot \mathbf{s}_i + \boldsymbol{\varepsilon}_{i,t}. \quad (6)$$

In equation (6), $D_{i,t}$ denotes the number of delinquent loan installments (delinquencies) of a loan disbursed in year t to a client i. Furthermore, α is a constant, as_i is a dummy variable accounting for farmers with standard loans, asg_i is a dummy variable accounting for farmers with standard loans and grace periods[11], af_i is a dummy variable accounting for farmers with flex loans, afg_i is a dummy variable accounting for farmers with flex loans and grace periods, nsg_i is a dummy variable accounting for non-farmers with standard loans and grace periods, nf_i is a dummy variable accounting for non-farmers with flex loans, and nfg_i is a dummy variable accounting for non-farmers with flex loans and grace periods. Moreover, $\mathbf{x}_{i,t}$ is the vector of client and loan characteristics[12], Y_t is a time constant for the year t of loan disbursement, $\mathbf{s}_i$ is a vector of dummy variables accounting for the branch offices where the loan was disbursed, $\boldsymbol{\gamma}$ and $\mathbf{u}$ are parameter vectors, and $\boldsymbol{\varepsilon}_{i,t}$ denotes the over i and t independently and identically distributed error term with a mean of zero and a variance of $\sigma_{\boldsymbol{\varepsilon}}^2$.

In equation (6), it is obvious that we consider eight different client groups, thereof the eight groups, non-farmers with standard loans without grace periods, serves as the reference group. This reference group is reasonable for three reasons: First, it comprises the majority of all borrowers of ABM; second, this group can be observed since the MFI was founded, and, third, this group is the benchmark for the ABM management to judge the success of any

[11] A graced installment is defined by the bank as a repayment installment with a principal amount ≤ 50 % of the average principal amount. The average principal amount is defined as the monthly annuity payment calculated, based on the interest rate and the maturity of the loan.

[12] The vector includes fixed assets, business income, business expenses, disbursed loan amount, age, gender, marital status, family size, work experience of the client, whether the client is a repeat client or holds a deposit with ABM, and the number of loan installments due at the time of extracting the data from the MIS. Continuous client and loan characteristics are included in their squared form to allow for influences in addition to linear.

product modification. Because we focus in our analysis on farmers with standard loans without grace periods, farmers with flex loans without grace periods, and farmers with flex loans with grace periods only, the results for these groups are interpreted in detail in the results section. Furthermore, our estimation results for the branch office vector and the time constants are not reported in the results section. In our estimation, the number of passed loan installments is considered as an additional control variable because not all loans are yet fully repaid and the dependent variable is not a relative measure.

Equation (6) is estimated for the three different delinquency categories presented in the data section. By applying our second and third risk indicator (delinquency II and III), we thereby extend the approach of Raghunathan et al. (2011) and Al-Azzam et al. (2012) by two additional risk measures. Although the credit risk increases from the first to the third risk indicator, all three indicators provide a good judgment for credit risk. This is because first, performance bonuses paid to loan officers decrease with increasing portfolio risk levels (starting with one day delinquencies). Second, the internal procedures of the bank require that loan officers start to remind clients about their next repayment installment (either by phone or by person) three days before payment is due. Thus, it is very unlikely for clients to forget to repay.

Given the censored structure of our delinquency measures, we estimate equation (6) by three different Tobit models.

Results and Discussion

The results of the three Tobit estimations (repayment function) are presented in Table 3. The explanatory power of the three models is considered to be moderate with a pseudo R^2 of 0.07, 0.09, and 0.11 for the delinquency category I, II, and III, respectively.

[Insert Table 3 about here]

The results of our Tobit estimations reveal no significant delinquency differences between non-seasonal farmers and non-farmers, both with standard loans and without grace periods. This leads us to an acceptance of our first hypothesis, H1 "Farmer Standard," which hypothesizes that delinquencies of farmers with standard loans are not different from those of non-farmers with standard loans. Taking into consideration that farmers with standard loans are non-seasonal farmers with continuous returns, this result does not seem surprising. Thus, our results reveal that standard loans seem to be adequate for farmers with continuous returns. However, these results confront the widespread wisdom that agricultural borrowers are

generally riskier than non-agricultural borrowers. This at least applies for agricultural producers with non-seasonal production types. Hence, our results are in line with the findings of Vogel (1981), Raghunathan et al. (2011), and Weber and Musshoff (2012). These results are consistent over all three delinquency categories.

We additionally find no significant differences between seasonal farmers with flex loans and non-farmers with standard loans (both groups without grace periods). This leads us to an acceptance of our second hypothesis, H2 "Farmer Flex," which hypothesizes that delinquencies of farmers with flex loans and non-farmers with standard loans (both groups without grace periods) are not significantly different. The provisioning of flex loans to seasonal farmers does not increase credit risk. These results are consistent for all three delinquency categories applied. Despite the seasonality of this group of farmers, grace periods were not foreseen in the repayment schedule structured by the loan officer. Our results reveal that there is no reason to assume otherwise.

The question of whether grace periods affect the repayment behavior of seasonal farmers with flex loans and with grace periods was the motivation for our third hypothesis, H3 "Farmer Flex Grace Period," which hypothesizes that loan delinquencies of farmers with flex loans and grace periods are not significantly different from those of non-farmers with standard loans and without grace periods. Here, our results are mixed. We find significant positive effects for the first and the second delinquency categories, but an insignificant effect for the third category. This leads us to an acceptance of our third hypothesis for the first and second delinquency categories and to a rejection for the third delinquency category. Hence, our results are in line with the mixed findings for the effects of grace periods on loan repayment from the experimental literature, e.g. (Field and Pande, 2008; Field et al., 2010). Our findings indicate that seasonal farmers with flex loans and grace periods struggle more to repay their loans than non-farmers without grace periods, but as soon as the consecutive loan installment is due (30 days after the previous) this group of farmers is able to repay on time. During our field visits, which also included numerous flex loan assessments and credit committees, we experienced that deciding the amount of time to be graced by a grace period is the most difficult task in flex loan assessments. Farmers know exactly that grace periods can increase the total interest to be paid for the loan, and for this reason, some of them try to negotiate the graced amounts to a minimum. Taking this into consideration, the higher credit risk of seasonal farmers with flex loans and grace periods, indicated by the delinquency categories I and II, suggests that grace period decisions need to be made carefully to keep credit risk on average level.

Of our control variables (client and loan data) we find the results for *fixed assets*, the *marital status*, the number of *family members*, and the bank-customer relationship indicated by *deposit* and *repeat client* to be of special interest. Our results reveal that there is a significant and negative influence of the amount of *fixed assets* held by a client. Even if this effect is not as pronounced as, e.g., for the *business income*, it indicates that material collateral plays a significant role in the repayment behavior in Madagascar. Given the focus of microfinance on social collateral, this result is surprising. Furthermore, we find that married clients show significantly lower delinquencies than clients who are single and that this effect is the strongest in the third risk category. A similar effect can be stated for the number of family members, where an increasing number of family members leads to a better repayment performance. This might be explained by additional income available from other family members apart from the project financed by the loan. For the client-customer relationships indicated by whether the client holds a *deposit* with the bank and whether the client was granted a loan before, we find that holding a deposit significantly improves the repayment quality, while being a *repeat client* significantly increases delinquencies. The latter is surprising and might indicate a less strict loan assessment for consecutive loans, maybe because of positive experiences with past loans or a declining repayment incentive for clients as soon as the consecutive loan is granted.

Summary and Conclusion

One of the main reasons for the success of microfinance is the provisioning of standard loans with loan repayments starting immediately after loan disbursement. But even if repayment installments of standard loans are adapted to the income of the borrower, repayment schedules cannot be harmonized with the cash flow occurrence. This might be the reason for the low penetration of entrepreneurs with seasonal returns which are typically found in the agricultural sector. Most MFIs are still reluctant to make repayment schedules of standard loans more flexible out of fear that more flexibility might reduce repayment quality.

Therefore, the objective of this paper is to first provide empirical evidence how the provisioning of microfinance loans with flexible repayment schedules affects loan delinquencies of agricultural borrowers. Flexible repayment schedules allow a redistribution of principal payments during periods with low agricultural returns (grace periods) to periods when agricultural returns are high. In order to do so, we develop a theoretical framework and apply and estimate an econometric model with data provided by a MFI in Madagascar.

Thereby, we consider loan delinquencies of seasonal and non-seasonal agricultural and non-agricultural microfinance loans with/without repayment schedule flexibility.

Our results reveal that delinquencies of non-seasonal farmers and seasonal farmers with inflexible repayment schedules are not significantly different from those of non-farmers. Furthermore, we find that seasonal farmers with flexible repayment schedules show significantly higher delinquencies than non-farmers in low delinquency categories but we also find that this effect disappears in the highest delinquency category.

Our findings suggest that financing agricultural micro-borrowers does c.p. not increase the credit risk for the financial institution providing the loan if non-seasonal farmers receive standard loans without grace periods or seasonal farmers receive flex loans with grace periods. This credit risk effect for flex loans with grace periods accounts for a higher credit risk. These findings confront the widespread wisdom that lending to agricultural firms is associated with higher credit risk than lending to non-agricultural firms. Because the investigated agricultural clients with standard loans are non-seasonal agricultural producers, our results suggest the adequacy of standard loans for agricultural producers with continuous returns. Furthermore, all clients with flex loans are seasonal agricultural producers, suggesting that the provisioning of loans to that group needs to be carefully implemented when it comes to the decision of whether or not to grant grace periods. For this group, carefully applied grace periods seem to be the key attribute to keeping the repayment quality on the level of non-agricultural clients with standard loans.

Our expert interviews reveal that the costs of borrowing for flex loans are only slightly higher when compared to standard loans; and flex loans (with/without grace periods) show the same delinquency levels in the highest delinquency category as non-agricultural clients with standard loans. Thus, the higher borrowing costs do not need to compensate for higher credit risk. For flex loans with grace periods, the effect of higher credit risk in the lower delinquency categories needs to be carefully investigated. Even if the bank faces no costs for loan loss provisions, the increased efforts for the loan officers to remind the client of the outstanding installment might be large. Moreover, grace periods can also increase the time span the principal amount is outstanding and, hence, increase the returns of the MFI. It must also be considered that the generally time-consuming client assessment procedures in microfinance are even more sophisticated and, therefore, costly for the agricultural sector. Furthermore, the cash flow of borrowers depends much more on market price developments and unforeseeable weather events which need to be judged carefully by the loan officers and the credit

committee. Thus, the higher delinquency levels of flex loans with grace periods in the low delinquency categories might also be related to inadequate decisions how many of the clients' loan installments had to be graced to match their returns with their debt obligations. Judging the need for grace periods conservatively might increase the costs of borrowing for the client. However, as our results reveal, in the long term this might be better than increasing the costs of lending due to higher collection efforts when loans are in arrears. Even if we can show that the provisioning of loans with grace periods to farmers does not increase the high credit risk for the MFI, our results might change with more business experience and also with an increasing number of loans disbursed by the MFI to agricultural firms.

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Table 1: Descriptive Statistics – Client Groups

Variable[1]		Unit[2]	Farmer[3] Standard Loan		Farmer[3] Flex Loan		Non-Farmer[4]	
			Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Delinquency I		number	1.10***	2.00	0.69***	1.40	1.24	2.21
Delinquency II		number	0.11***	0.72	0.05***	0.37	0.16	0.90
Delinquency III		number	0.07***	0.60	0.02***	0.30	0.10	0.75
Fixed Assets		ThsMGA	2,848***	8,647	1,734***	2,215	3,093	14,642
Business Income		ThsMGA	1,993***	3,716	569***	987	3,680	6,697
Business Expenses		ThsMGA	1,679***	3,515	353***	805	3,327	6,449
Disbursed Loan Amount		ThsMGA	1,550**	1,881	846***	890	1,651	2,274
Age		years	40.60***	10.13	41.42***	10.77	39.82	9.67
Gender (Female)		1/0	0.50***	-	0.26***	-	0.60	-
Marital Status (Married)		1/0	0.89***	-	0.90***	-	0.86	-
Family Members		number	4.13***	1.76	5.01***	2.05	3.96	1.70
Work Experience		month	107***	133	214***	226	127	155
Deposit (Yes)		1/0	0.80***	0.40	0.85***	0.36	0.80	0.39
Repeat Client (Yes)		1/0	0.45***	0.50	0.21***	0.41	0.48	0.50
Passed Installments		number	8.47	4.13	5.34***	3.81	8.49	3.92
Disbursement Year	2007 (Yes)	1/0	0.01***	-	0.00***	-	0.04	-
	2008 (Yes)	1/0	0.07***	-	0.00***	-	0.10	-
	2009 (Yes)	1/0	0.11***	-	0.00***	-	0.15	-
	2010 (Yes)	1/0	0.20	-	0.02***	-	0.21	-
	2011 (Yes)	1/0	0.30***	-	0.27	-	0.27	-
	2012 (Yes)	1/0	0.31	-	0.71***	-	0.23	-
Branch Office N^{o}	1 (Yes)	1/0	0.03***	-	0.00***	-	0.07	-
	2 (Yes)	1/0	0.07***	-	0.00***	-	0.19	-
	3 (Yes)	1/0	0.03**	-	0.00***	-	0.08	-
	4 (Yes)	1/0	0.06***	-	0.00***	-	0.09	-
	5 (Yes)	1/0	0.26***	-	0.00***	-	0.12	-
	6 (Yes)	1/0	0.05***	-	0.00***	-	0.08	-
	7 (Yes)	1/0	0.08	-	0.00***	-	0.08	-
	8 (Yes)	1/0	0.09	-	0.26***	-	0.09	-
	9 (Yes)	1/0	0.06***	-	0.15***	-	0.03	-
	10 (Yes)	1/0	0.11***	-	0.28***	-	0.03	-
	11 (Yes)	1/0	0.02***	-	0.00***	-	0.06	-
	12 (Yes)	1/0	0.06***	-	0.00***	-	0.02	-
	13 (Yes)	1/0	0.04***	-	0.27***	-	0.01	-
	14 (Yes)	1/0	0.02	-	0.00***	-	0.02	-
	15 (Yes)	1/0	0.02***	-	0.00***	-	0.02	-
	16 (Yes)	1/0	0.00***	-	0.00***	-	0.01	-
	17 (Yes)	1/0	0.00***	-	0.04***	-	0.00	-
Number of Observations, thereof		number	2,790		2,928		74,801	
with grace period s		number	35		1,893		409	

[1] Delinquencies I, II and III indicate the number of loan installments that were missed by ≥ 1, ≥ 15, and ≥ 30 days respectively when due.

[2] ThsMGA, thousand Malagasy-Ariary. Mean values for dummy variables (1/0) indicate ratios.

[3] Farmer Standard Loan, farmer with standard loan; Farmer Flex Loan, farmer with flex loan. Comprises only primary agricultural producers, i.e., livestock, crop, as well as fruit and vegetable producers.

[4] Non-Farmer, non-farmer with standard or flex loan; ***,**,* indicate a significant mean difference between farmers with standard loans/farmers with flex loans compared to non-farmers on a 1%, 5%, and 10% level respectively.

Table 2: Descriptive Statistics – Delinquency Categories

Variable[1]		Unit[2]	Delinquency I[3]		Delinquency II[3]		Delinquency III[3]	
			Mean	SD	Mean	SD	Mean	SD
Farmer Standard Loan		1/0	0.03	-	0.03	-	0.02	-
Farmer Flex Loan (FL)		1/0	0.01	-	0.00	-	0.00	-
Farmer FL + Grace Period		1/0	0.02	-	0.02	-	0.01	-
Non-Farmer Standard Loan		1/0	0.93	-	0.94	-	0.95	-
Fixed Assets		ThsMGA	2,896	11,179	2,700	9,162	2,614	9,561
Business Income		ThsMGA	3,532	6,235	4,050	6,459	4,439	7,187
Business Expenses		ThsMGA	3,181	6,036	3,648	6,235	4,031	6,999
Disbursed Loan Amount		ThsMGA	1,688	2,287	1,935	2,578	2,020	2,560
Age		years	39.49	9.48	38.30	9.08	37.84	8.80
Gender (Female)		1/0	0.57	0.49	0.58	0.49	0.58	-
Marital Status (Married)		1/0	0.85	0.36	0.81	0.39	0.81	-
Family Members		number	3.87	1.75	3.34	1.70	3.27	1.69
Work Experience		month	127	150	118	109	117	111
Deposit (Yes)		1/0	0.73	0.45	0.49	0.50	0.45	-
Repeat Client (Yes)		1/0	0.50	0.50	0.46	0.50	0.49	-
Passed Installments		number	9.76	3.40	10.28	3.59	10.59	3.70
Disbursement Year	2007 (Yes)	1/0	0.03	-	0.04	-	0.04	-
	2008 (Yes)	1/0	0.10	-	0.15	-	0.15	-
	2009 (Yes)	1/0	0.16	-	0.19	-	0.19	-
	2010 (Yes)	1/0	0.23	-	0.24	-	0.26	-
	2011 (Yes)	1/0	0.34	-	0.32	-	0.32	-
	2012 (Yes)	1/0	0.14	-	0.06	-	0.04	-
Branch Office N^{o}	1 (Yes)	1/0	0.07	-	0.07	-	0.07	-
	2 (Yes)	1/0	0.19	-	0.23	-	0.26	-
	3 (Yes)	1/0	0.08	-	0.10	-	0.11	-
	4 (Yes)	1/0	0.10	-	0.13	-	0.13	-
	5 (Yes)	1/0	0.13	-	0.11	-	0.10	-
	6 (Yes)	1/0	0.08	-	0.08	-	0.07	-
	7 (Yes)	1/0	0.08	-	0.05	-	0.05	-
	8 (Yes)	1/0	0.10	-	0.11	-	0.11	-
	9 (Yes)	1/0	0.03	-	0.02	-	0.02	-
	10 (Yes)	1/0	0.04	-	0.03	-	0.03	-
	11 (Yes)	1/0	0.05	-	0.04	-	0.03	-
	12 (Yes)	1/0	0.02	-	0.00	-	0.00	-
	13 (Yes)	1/0	0.01	-	0.01	-	0.01	-
	14 (Yes)	1/0	0.01	-	0.00	-	0.00	-
	15 (Yes)	1/0	0.01	-	0.01	-	0.01	-
	16 (Yes)	1/0	0.00	-	0.00	-	0.00	-
	17 (Yes)	1/0	0.00	-	0.00	-	0.00	-
Number of Observations		number	33,340		4,004		2,403	

[1] Farmer Standard Loan, farmer with standard loan; Farmer Flex Loan (FL), farmer with flex loan; Non-Farmer Standard Loan, non-farmer with standard loan; Farmer comprises only primary agricultural producers, i.e., livestock, crop, as well as fruit and vegetable producers.

[2] ThsMGA, thousand Malagasy-Ariary. Mean values for dummy variables (1/0) indicate ratios.

[3] Delinquencies I, II, and III indicate mean values and standard deviations for all variables for groups with missed loan installments of ≥ 1, ≥ 15, and ≥ 30 days respectively when due.

Table 3: Estimation Results

Variable	Unit[2]	Tobit Estimations[3]		
		Delinquency I[4]	Delinquency 1I[4]	Delinquency III[4]
Intercept		-3.348***	-11.00***	-14.94***
		(0.263)	(0.932)	(1.348)
Farmer[1] Standard Loan (as)	1/0	-0.0864	-0.193	-0.260
		(0.0869)	(0.319)	(0.461)
Farmer[1] Flex Loan (af)	1/0	0.00358	-0.651	-1.609
		(0.171)	(0.875)	(1.592)
Farmer[1] Flex Loan + Grace Period (afg)	1/0	0.890***	1.968***	1.093
		(0.113)	(0.451)	(0.719)
Fixed Assets	ThsMGA	-0.00000621**	-0.0000257*	-0.0000398*
		(0.00000217)	(0.0000109)	(0.0000184)
Fixed Assets Square	-	1.77e-12	1.16e-11*	1.90e-11*
		(1.41e-12)	(5.39e-12)	(8.98e-12)
Business Income	ThsMGA	0.0000633	0.000370**	0.000494**
		(0.0000480)	(0.000137)	(0.000168)
Business Income Square	-	-1.25e-09	-6.11e-09*	-1.11e-08**
		(9.08e-10)	(2.78e-09)	(3.80e-09)
Business Expenses	ThsMGA	-0.0000738	-0.000326*	-0.000408*
		(0.0000475)	(0.000134)	(0.000160)
Business Expenses Square	-	1.31e-09	5.85e-09*	1.08e-08**
		(9.31e-10)	(2.82e-09)	(3.78e-09)
Disbursed Loan Amount	ThsMGA	0.00000546	0.000169*	0.000200
		(0.0000248)	(0.0000768)	(0.000104)
Disbursed Loan Amount Square	-	2.70e-09	-4.15e-09	-7.84e-09
		(1.44e-09)	(4.11e-09)	(5.77e-09)
Age	years	0.0321**	0.0633	0.0873
		(0.0118)	(0.0430)	(0.0629)
Age Square	-	-0.000725***	-0.00146**	-0.00200**
		(0.000137)	(0.000510)	(0.000755)
Gender (Female)	1/0	0.0167	-0.0432	-0.0249
		(0.0335)	(0.109)	(0.153)
Marital Status (Married)		-0.525***	-0.600***	-0.746***
		(0.0503)	(0.157)	(0.223)
Family Members	number	-0.155***	-0.539***	-0.530***
		(0.0228)	(0.0460)	(0.146)
Family Members Square	-	0.00545*	0.00943**	-0.00209
		(0.00227)	(0.00324)	(0.0193)
Work Experience	month	-0.000127	-0.00154**	-0.00175*
		(0.000110)	(0.000502)	(0.000732)
Work Experience Square	-	1.64e-08	-0.000000118*	-0.000000122
		(1.68e-08)	(4.71e-08)	(6.67e-08)
Deposit (Yes)	1/0	-2.265***	-4.535***	-5.339***
		(0.0425)	(0.125)	(0.172)
Repeat Client (Yes)	1/0	0.583***	0.740***	1.050***
		(0.0343)	(0.113)	(0.158)
Passed Installments	number	0.799***	0.633***	0.683***
		(0.0242)	(0.0762)	(0.103)
Passed Installments Square	-	-0.0176***	-0.00830*	-0.00616
		(0.00136)	(0.00365)	(0.00461)
Year Dummies		Yes	Yes	Yes
Branch Office Dummies		Yes	Yes	Yes
Number of Observations, thereof		74,253	74,253	74,253
Consored at the threshold of zero		43,653	70,669	72,106
Log-Likelihood Value		-105,908.22	-19,877.79	-12,904.765
(pseudo) R-square		0.07	0.09	0.11

[1] Comprises only primary agricultural producers, i.e., livestock, crop, as well as fruit and vegetable producers.

[2] ThsMGA, thousand Malagasy-Ariary.

[3] ***,**,* indicate a significance on 1%, 5%, and 10% levels respectively. Robust standard errors in parentheses. Reference group for all client groups in the upper block is "Non-farmer standard loan without grace periods"; reference year for the year dummies is 2012, for the vector of branch offices, branch office one.

[4] Indicates the number of loan installments that were missed by ≥ 1, ≥15, and ≥ 30 days respectively when due.

Diskussionspapiere

2000 bis 31. Mai 2006
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Die Wurzeln der **Fakultät für Agrarwissenschaften** reichen in das 19. Jahrhundert zurück. Mit Ausgang des Wintersemesters 1951/52 wurde sie als siebente Fakultät an der Georgia-Augusta-Universität durch Ausgliederung bereits existierender landwirtschaftlicher Disziplinen aus der Mathematisch-Naturwissenschaftlichen Fakultät etabliert.

1969/70 wurde durch Zusammenschluss mehrerer bis dahin selbständiger Institute das **Institut für Agrarökonomie** gegründet. Im Jahr 2006 wurden das Institut für Agrarökonomie und das Institut für Rurale Entwicklung zum heutigen **Department für Agrarökonomie und Rurale Entwicklung** zusammengeführt.

Das Department für Agrarökonomie und Rurale Entwicklung besteht aus insgesamt neun Lehrstühlen zu den folgenden Themenschwerpunkten:

- Agrarpolitik
- Betriebswirtschaftslehre des Agribusiness
- Internationale Agrarökonomie
- Landwirtschaftliche Betriebslehre
- Landwirtschaftliche Marktlehre
- Marketing für Lebensmittel und Agrarprodukte
- Soziologie Ländlicher Räume
- Umwelt- und Ressourcenökonomik
- Welternährung und rurale Entwicklung

In der Lehre ist das Department für Agrarökonomie und Rurale Entwicklung führend für die Studienrichtung Wirtschafts- und Sozialwissenschaften des Landbaus sowie maßgeblich eingebunden in die Studienrichtungen Agribusiness und Ressourcenmanagement. Das Forschungsspektrum des Departments ist breit gefächert. Schwerpunkte liegen sowohl in der Grundlagenforschung als auch in angewandten Forschungsbereichen. Das Department bildet heute eine schlagkräftige Einheit mit international beachteten Forschungsleistungen.

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