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## Growth patterns of microfinance clients - Evidence from Sub-Saharan Africa

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# Growth patterns of microfinance clients – Evidence from Sub-Saharan Africa

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## *Abstract*

We provide evidence on the growth patterns of microfinance clients. Our analysis is motivated by the debate on the impact of microfinance on client income and growth. Based on loan-level data from close to 40,000 clients in Sub-Saharan Africa we make use of an econometric approach widely employed in the firm growth literature. Results show that on average clients exhibit substantial growth between two consecutive loans. Moreover, there is a non-linear relationship between initial client size and growth: smaller businesses show higher growth rates which is marginally counteracted by positive growth of the very large clients. Results also indicate that growth rates decline in the course of the lending relationship. Overall our results provide econometric support for the largely anecdotal evidence presented by microfinance practitioners that their clients grow. At the same time they suggest that the “equilibrium size” of most clients remains small.

Keywords: microfinance, firm growth, Sub-Saharan Africa  
JEL classification: D22, G21, L25

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## **1. Introduction**

Do microfinance clients grow? And if so, how do growth patterns evolve in the course of the lending relationship? What are the factors driving growth of clients? This paper provides evidence on the growth experience of close to 40,000 microfinance clients in three Sub-Saharan African countries after having received a total of 127,000 loans over a period of up to ten years. The paper is motivated by the debate on the usefulness of microfinance as a development policy tool. The debate has been triggered by results of various studies based on randomized control trials suggesting that the impact of microfinance on clients' income and poverty levels is small (Banerjee et al. 2009, Karlan and Zinman 2009). Confronted with these results microfinance practitioners have referred to their hands-on experience on the ground according to which many of their clients record significant growth and a reduction of poverty (Accion International et al. 2010). Moreover, studies on the portfolios of the poor (Collins et al. 2009) suggest that clients perceive microfinance as highly valuable. However, largely presented in the form of stories about individual clients, those claims are based on anecdotal evidence. Thus, as Romer (1994) put it in a different context, they suffer from the fact that they do not come with an attached t-statistic and hence tend to be neglected in discussions that focus on testing and rejecting models.

This paper presents rigorous empirical evidence on the growth of microfinance clients. Thus, it fills a gap between impact studies and the largely anecdotal evidence microfinance practitioners rely upon. Moreover, and in contrast to impact studies, our analysis (1) takes a long-run view on clients' growth patterns, (2) is based on large samples of borrowers, and (3) provides evidence on growth patterns of the average client and of clients that record above-average growth. Our analysis is based on the insights and the methodology of the empirical business growth literature as surveyed by Nichter and Goldmark (2009) and Coad (2009). Thus, the paper – while motivated by the microfinance impact debate – provides a contribution to the empirical literature on enterprise growth. Despite the prominent role of micro businesses in developing and emerging market countries (Liedholm and Mead 1999, Webb et al. 2012) those enterprises are often excluded from empirical business growth studies either due to a lack of data or due a lack of interest. The latter reflects a widespread perception in the business growth literature that microenterprises do not have any growth potential.

Our main results can be summarized as follows: On average microfinance clients show substantial growth between two consecutive loans. Moreover, there is a non-linear relationship between initial client size and growth: smaller businesses show higher growth rates which is marginally counteracted by positive growth of the very large clients. Results also show that growth rates decline in the course of the lending relationship and over a longer period approach the level of the growth rate of GDP per capita. We also find, albeit not in all countries that on average clients engaged in trade and operating as legal entities record higher growth rates. By contrast, the gender of the client does not play a

significant role in explaining differences in growth patterns. Overall, our results provide comfort for microfinance practitioners who – confronted with a debate about the usefulness of microfinance as a development tool – have argued that their clients on average grow.

The paper is structured as follows. After this introduction, we briefly review the two strands of literature our paper is based on: the microfinance impact literature and the enterprise growth literature (Section 2). We introduce our data in Section 3. Sections 4 and 5 present descriptive statistics and the methodology employed. Results and robustness checks are shown and analyzed in Sections 6 and 7. The paper ends with a summary and conclusions (Section 8).

## **2. Microfinance and micro businesses**

Since its beginnings in the mid 1970s microfinance has offered a simple promise, namely that providing access to formal sector credit and other financial services is a key prerequisite for lifting people out of poverty and creating jobs and employment in developing countries (Helms 2006). The promise is based on three interrelated arguments (Wagner and Winkler 2012): First, traditional banks are neither able nor willing to serve poor people. Accordingly, a frontier of finance (von Pischke 1991) separates micro and small businesses from medium and large businesses in developing countries as the former lack access to formal financial sector services while the latter are readily served by traditional commercial banks. Second, access to financial services is important for development and growth as the financial system performs a major allocative function by lending funds to agents with higher returns to capital than those that deposit funds at financial intermediaries and markets (Bodie and Merton 1995, Banerjee and Duflo 2010). Third, providing financial access to poor people is expected to yield substantial benefits. Following one of the most basic economic propositions, namely the law of declining marginal returns to capital, the capital-poor can be assumed to have investment opportunities with high marginal returns (for an intensive discussion of this, see Karlan and Morduch 2009). These three arguments together have proved highly instrumental in fostering a global microfinance industry.

Over the last years, however, the effectiveness of microfinance in promoting growth and reducing poverty has been seriously questioned by results of modern impact studies.<sup>1</sup> Applying a randomized control trial (RCT) approach (Armendáriz and Morduch 2010, 293 ff.) in assessing “how the lives of people in a program changed compared to how their lives would have changed if the program had not existed” (Bauchet et al. 2011), results suggest that the impact of microlending is small, if there is any impact at all. This also holds for business variables like employment growth (Banerjee et al. 2009). Karlan and Zinman (2009) even find that access to credit is associated with a decline in employment as the treatment group, i.e. businesses with access or use of credit, sheds unproductive workers.

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<sup>1</sup> An early warning suggesting that the microfinance promise is oversold was presented by Morduch (1999).

Overall, "it remains unclear under what circumstances, and for whom, microfinance has been and could be of real, rather than imagined, benefit to poor people" (Duvendack et al. 2011, 75)<sup>2</sup>

The results of modern impact studies have triggered a debate about the usefulness of microfinance as a development policy tool (Chowdhury 2009, Terberger 2012).<sup>3</sup> Some proponents of the microfinance approach argue that the lack of a strong impact on income growth and employment can be explained by economies of scale arguments and other characteristics of the business environment and microfinance clients that are detrimental to growth.<sup>4</sup> However, microfinance is still a useful instrument of development policy as it allows for consumption smoothing and provides significant risk management benefits (Collins et al. 2009). According to this view, microfinance is less of a tool of fighting poverty and raising incomes but an instrument to improve the quality of life *within* the condition of poverty (Odell 2010). At the same time, microfinance institutions should expand their lending activities to small and medium-sized businesses (SMEs) as they are more likely to grow and to providing formal sector employment opportunities (Glisovic and Martinez 2012). Other observers question the policy relevance of the results of modern impact studies by referring to several shortcomings of the RCT approach (Armendáriz and Morduch 2010):

- First, RCT results reflect the impact of a one-time access or use of credit (or other financial services) over a short period, with two years being the maximum period analysed.<sup>5</sup> However, it is unlikely that receiving a short-term loan once can have a strong impact on client income or employment in the respective microbusiness. Indeed, microfinance credit technologies and the setting up of sustainable microfinance institutions reflect the insight that the typical microfinance client has a long-term, continuous need of financial services, in particular working capital finance (Krahn and Schmidt 1994). Thus, the impact effect properly measured should be of a long term nature as well. However, the RCT approach cannot be applied for a long term analysis since it is inherently difficult to strictly separate the impact of the loan on growth, employment and poverty from other influences over a longer period.
- Second, results are based on small samples of borrowers in a few communities and regions as the costs for implementing RCTs are high. Thus, the generality of the results can be questioned (Hermes and Lensink 2011).

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<sup>2</sup> A similar conclusion is drawn by Van Rooyen et al. (2012) in their review of microfinance impact analyses in sub-Saharan Africa.

<sup>3</sup> The results of academic impact studies represent only one trigger of this debate. Others include the over-indebtedness problems of some clients of microfinance institutions (Schicks 2010), the suicides of microfinance clients in India (CGAP 2010) and the vulnerability of microfinance in the global financial crisis (Wagner 2012). The debate has many facets. For example Bateman and Chang (2009) attack microfinance from various perspectives, with a lack of impact being only of them.

<sup>4</sup> Other explanations of the inconclusive results include references to mere substitution effects, i.e. that microfinance does not provide access to finance as such but access to *formal* finance. As the latter presents a substitute of the more expensive and less reliable informal finance only (Armendáriz and Morduch 2010, 67f.), the growth effect cannot be large

<sup>5</sup> For example, Banerjee et al. (2009) measure the impact of the availability of microcredit 15 to 18 months after the establishment of branches of the respective lending institution in urban India

- Third, results reflect – inherently, due to the research design – differences between the *average* client and the *average* non-client only. However, empirical research on growth patterns of businesses has shown that on average businesses barely grow (Nichter and Goldmark 2009). Thus, “there is little point in trying to find the determinants of growth for the ‘average firm’, because this latter grows so little that its growth could be due to almost anything ...” (Coad 2009, 6). As modern impact studies are based on the idea that credit is a – or “the” – major determinant of business growth, it is no surprise to find no confirming evidence for this proposition.

The last point reflects insights from an extensive literature on the empirics of firm growth in mature and emerging economies. However, insights from this literature are largely ignored in the microfinance debate (and vice versa).<sup>6</sup> There may be two interrelated reasons for this:

- First, the main insight of the business growth literature, namely that *on average* firms do not grow, presents a blow to both, the microfinance promise that it can be a major tool to foster income of the typical microfinance client, and to the “surprise effect” the RCT results has generated in the industry.<sup>7</sup> Only few businesses, the so-called “gazelles”, are characterized by substantial and fast growth. Analyses of those firms reveal that their growth performance might be determined by other factors than the growth performance of the average growing firm (Coad and Rao 2008, Goedhuys and Sleuwaegen 2010).<sup>8</sup>
- Second, the business growth literature often explicitly excludes microbusinesses or businesses operating in the informal sector, i.e. the typical microfinance clients, in their analyses either due to a lack of data or because (informal) microenterprises are not regarded as growth oriented or as businesses with growth potential (e.g. Ayyagari et al. 2011, Goedhuys and Sleuwaegen 2010). Indeed, it is one of the few quite robust results of the empirical business growth literature that „most firms start small, live small and die small (...). They never embark on a significant growth trajectory” (Davidsson et al. 2007, 368), also because they focus on survival (and stability) rather than expansion, i.e. are “survivalists” and “content” with the given size of business operations (Vos et al. 2007).<sup>9</sup> Moreover, most characteristics of microfinance clients, like informality, a low level of education, firm located in the household,

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<sup>6</sup> For example, neither the microfinance textbook by Armendáriz and Morduch (2010) nor the survey articles by Morduch (1999) and Karlan and Morduch (2012) refer to the business growth literature. A notable exception is Vogelgesang (2001).

<sup>7</sup> The result that on average businesses do not grow presents a challenge for most policy approaches that aim at fostering economic growth, employment and development by supporting micro, small and medium-sized businesses or business start-ups; see Beck and Demirguc-Kunt (2006), Mandelman and Montes-Rojas (2009), and – quite provocatively – Shane (2009).

<sup>8</sup> Liedholm and Mead (1999, 94) refer to the fast growing micro businesses as “graduates”. Interestingly, they find that access to credit is a less binding constraint for the “graduates” than for the average micro and small business that does not show any growth.

<sup>9</sup> Thus, when referring to „gazelles“, the literature usually defines a minimum size firms have to have in order to qualify as high growth firms (Henrekson and Johansson 2010). In general, this minimum size, i.e. at least USD 100,000 in annual revenues or a minimum of ten employees, is substantially larger than the size of most clients in our sample of microfinance clients.

women-owned businesses, poor infrastructure and an unfavorable business environment are usually associated with below average growth (Goedhuys and Sleuwagen 2010, Nichter and Goldmark 2009). Thus, it may be optimal for firms to stay small. Accordingly, “efforts to promote growth of SMEs cannot be expected to be successful, unless institutional shortcomings are addressed first.” Beck and Demirguc-Kunt (2006, 2938)

At the same time, the business growth literature has generated many results on the growth patterns of firms that have not been tested with a sample of microfinance clients. However, those results – if confirmed – may provide insights about what can be reasonably expected from microfinance policy interventions in terms of growth and employment, if those variables are seen as benchmarks for the success of microfinance.<sup>10</sup> Against this background, we contribute to the debate on the usefulness of microfinance and the empirical business growth literature by analysing the long-run growth pattern of a large sample of borrowers from three microfinance institutions in three countries of sub-Saharan Africa. To the best of our knowledge this is the largest dataset in terms of microenterprises and years under observation that has been used to analyse the growth patterns of micro and small businesses in the microfinance and the business growth literature.<sup>11</sup>

Based on the microfinance literature and the literature on growth patterns of businesses we test the following hypotheses:

H1: On average, microfinance clients barely grow.

H2: Small and young firms grow faster than their larger and older counterparts (Coad 2009, 17, Nichter and Goldmark 2009, 1456)

H3: In the course of the lending relationship, as businesses mature, the growth rates of firms decline (Nichter and Goldmark 2009, 1456). In particular, this may hold for informal micro and small enterprises if they prefer to stay small given disincentives to formalise.

H4: Sector-specific dummy variables have no significant influence on average firm growth (Coad 2009, 93). However, the fastest growing firms tend to be less engaged in trade and services than in other sectors (Liedholm and Mead 1999, 96).

H5: Businesses run by women show slower growth (Coad 2009, 89, Nichter and Goldmark 2009, 1455).<sup>12</sup>

H6: The explanatory power of growth regressions is small as most studies show an  $R^2$  below 20% suggesting that firm growth is largely random (Coad 2009, 96).

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<sup>10</sup> As already mentioned before, this is a big “if”, as the major benefit of microfinance might be found in enhancing consumption smoothing and risk management opportunities.

<sup>11</sup> For example, the studies on micro, small and medium-sized business growth in sub-Saharan Africa referred to by Goedhuys and Sleuwagen (2010) are based on samples with a maximum number of businesses under review of 5,500 and a maximum length of the observation period of seven years.

<sup>12</sup> However, several studies on firms’ growth patterns, in particular for developed countries, find that gender has no significant effect on firm growth (Davidsson 2007, 371, Nichter and Goldmark 2009, 1456).

### 3. Data

We have access to loan level data of three institutions involved in microfinance operating in three countries of Sub-Saharan Africa, namely Mozambique, Ghana and Congo. They employ the unconventional individual lending technology with many of the features referred to in Armendáriz and Morduch (2010). Our data covers the period from the start of lending activities (2000 in Mozambique, 2002 in Ghana, and 2005 in Congo) until October 2011. The institutions in Mozambique and Congo operate as banks, the one in Ghana as a non-bank financial intermediary. Thus, our analysis is based on data from lenders that represent the commercial approach of microfinance (Christen and Drake 2002, Cull et al. 2009). The three countries differ in their terms of per capita income. In 2011 Mozambique and Congo had a per capita income of USD 535 and USD 231 respectively, while per capita income in Ghana was about USD 1,570 (World Development Indicators).

The databases we have access to include information on

- a) business characteristics of clients, i.e. sales, profits and total assets, the sector the client operates in (trade, services and other sectors), the legal form of the business (sole proprietor or legal entity) as well as the number of people employed in the business.
- b) personal characteristics, i.e. age, gender, and civil status of the client. However, this information is only available if the client operates as a sole proprietorship, i.e. is no legal entity.
- c) loan characteristics, i.e. the loan amount, the number of the loan the client has received from the respective lender, the loan maturity, the length of the period between two consecutive loans, the use of the loan (working capital or fixed assets), the interest rate, and the experience of the loan officer when approving the respective loan (see Table 1 in the appendix for a complete list of variables).

We follow the business growth literature and opt for the growth rate of sales between two consecutive loans as our main dependent variable.<sup>13</sup> We convert sales values from local currency into US Dollar and scale it by GDP per capita in the given year. Thus, the growth rate we calculate is benchmarked against GDP per capita growth: A growth rate above zero indicates that clients' sales growth has been larger than GDP per capita growth. Moreover, scaling sales by GDP per capita facilitate the comparison of clients' growth across countries by accounting for cross-country differences in GDP per capita growth. We follow the literature (Coad 2009) and calculate growth rates by taking the log-differences of sales scaled by GDP. Finally, we divide this growth rate by the number of months

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<sup>13</sup> As most of the clients are traders, accounting for at least 72% of total clients of the three lenders covered, we refrain from measuring growth based on total assets, as asset growth is a poor proxy for the growth of trade enterprises (see also the discussion on the proper growth measure in Davidsson et al (2007, 365f.) and Coad (2009, 9f.)).



between two loans to account for the fact that the length of the period between two loans differs substantially. Thus, our dependent variable is the monthly growth rate of sales between two consecutive loans scaled by GDP per capita.

Alternatively, we measure client growth by the growth rate of loan size and employment growth, respectively. We choose those variables as alternative growth measures because they are readily available and less subject to measurement errors than sales.<sup>14</sup> For the latter reason employment growth is the second most popular indicator used in the empirical business growth literature (Davidsson et al. 2007, 366) and the most widely used indicator for business growth in developing countries (Nichter and Goldmark 2009). This holds even though “indivisibilities are substantial for smaller firms” (Coad 2009, 9) as many of them do not see any growth in employment. Moreover, the creation of employment by microfinance clients is often referred to by development agencies and international financial institutions in explaining their support of microfinance institutions to the general public (see e.g. KfW 2011, Ayyagari et al. 2011). Finally, measuring growth by employment serves as a good robustness check as employment growth is usually rather uncorrelated with sales growth (Davidsson et al. 2007, 366). For loan size growth we calculate growth rates in a similar way as described for the growth rate of sales. By contrast, employment growth represents the monthly change of the number of people employed by clients between two consecutive loans.

Loan officers enter the respective data in the databases only after a loan application has been approved. Thus, we can calculate growth for repeated clients only, i.e. clients that have received a minimum of two loans. In addition, also for availability of data reasons, we focus our analysis on loans granted in the respective countries’ capitals and on business instalment loans, with the latter representing typical microloans (Armendáriz and Morduch 2010).<sup>15</sup> Moreover, we exclude loans

- that represent the 8th loan (or higher loan number) of the respective client as the number of clients that have received more than seven loans is very small, in particular in Ghana and Congo,
- without information on either loan amount or sales,
- when the amounts of total assets recorded for two consecutive loans are exactly the same as this is likely to reflect data quality issues.

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<sup>14</sup> These measurement errors do not necessarily imply that loan officers do not engage in a proper analysis of the clients or do not exert care when entering the data they have collected into the database. Rather, they reflect the inherent difficulties of measuring financial variables like sales, profits or assets of micro- and small enterprises, operating in the informal sector without compiling financial records and without strictly separating between household and business transactions (Honig 1998, Armendáriz and Morduch 2010).

<sup>15</sup> Other types of loans granted by the three lenders are credit lines, overdraft loans as well as loans to households, mainly in the form of housing (improvement) and consumer loans.

Finally, we control for outliers by excluding loans representing the 1<sup>st</sup> and 99<sup>th</sup> percentile of the variables sales growth, loan size growth, absolute employment growth and initial sales. In total our sample includes 39,844 clients receiving 127,097 loans (Table 1).

Table 1: Number of loans and clients included in the sample

	Mozambique	Ghana	Congo	Total
Number of approved loans in the sample	62,458	39,581	25,058	127,097
Number of repeated loans in the sample	44,571	26,345	16,337	87,253
Repeated clients in the sample	17,887	13,236	8,721	39,844

*Source: authors' compilation.*

It has to be stressed that our sample has a strong selection bias as it encompasses a peculiar segment of micro and small enterprises in the respective countries, namely those microbusinesses that received at least two loans.<sup>16</sup> Most importantly, businesses that

- never applied for a loan,
- were rejected when applying for a loan,
- received only one loan

are not represented in the sample due to a lack of data. Moreover, assuming that clients who record strong growth after having taken a loan are more likely to apply (or are more likely to be accepted by the lenders) for a consecutive loan, the selection bias increases over time.<sup>17</sup> Thus, our analysis should not be interpreted as an impact study because we do not have a control group of non-clients. We are unable to and do not analyze the counterfactual, i.e. how sales of clients would have developed without access to finance. Hence, our results should not be read as suggesting that the respective growth and growth patterns are caused by the clients' access to loans. Moreover, our sample is different from those used in business growth studies as it is not based on a survey of firms. Against this background, the evidence presented below should always and only be interpreted as evidence for growth and growth patterns of microfinance clients as such.

#### 4. Descriptive statistics

Descriptive statistics reveal that clients do not belong to the poorest segment of the population in their respective countries. The median level of sales when a client approaches the respective lender for the first time amounts to USD 1,223 in Mozambique, USD 2,901 in Ghana and USD 4,800 in Congo.

<sup>16</sup> Thus, the selection bias is substantially more pronounced than in samples covered in the business growth literature where researchers face the challenge to account for the exit of firms. As the probability of exit is higher for small than for large firms this selection bias may affect the relationship between business growth and the size of the firm as only growth of surviving firms is taken into account. For a discussion of these issues see Coad (2009, 43).

<sup>17</sup> However, in a study of microfinance clients in Bolivia Vogelgesang (2001, 23) finds that “the “best clients” discontinue borrowing after the first loan more often than others.” Thus, the selection bias might also work the other way round. Successful clients – due to their success – might prefer to discontinue the credit relationship as they either can fund their business with retained earnings (Degryse et al. 2012) or switch to a more established bank possibly offering a wider range of services (see Armendáriz and Morduch 2010).

Given a per capita income of USD 231 this suggests that in the latter country a substantial share of clients served may be qualified as small businesses. Clients in Congo are also larger in terms of employees than their counterparts in Ghana and Mozambique (a mean of 3.5 employees when approaching the lender for the first time, compared to 1.9 employees in Ghana and 1.8 employees in Mozambique). Moreover, there is a much higher share of legal entities among clients in Ghana and Congo ( $\approx 22\%$ ) compared to Mozambique (0.5%). Companies involved in trading activities account between 72% (Ghana) and 89% (Congo) of total loans. Businesses offering services are well represented in Ghana (20%), while the share of loans extended to clients engaged in other sectors, in particular agriculture, is non-negligible in Mozambique (13%).<sup>18</sup>

Clients running sole proprietorships are on average between 38 (Mozambique) and 40 (Congo) years old. Women account for the bulk of loans to sole proprietors in Mozambique (63%) and Ghana (72%), while the gender distribution is more equal in Congo. Most of the sole proprietor clients in Ghana and Congo are married. In Mozambique about half of the clients (51%) live in an informal partnership, also due to polygamy which is reported to be widespread in the country.

The descriptive statistics show that on average clients record growth of sales in the period between two loans. Indeed, their sales grow faster than GDP per capita. In Mozambique and Congo the growth lead of sales compared to GDP per capita is quite substantial as the average monthly growth rate of sales, scaled by GDP per capita, is 1% and 1.5% per month respectively. In Ghana client growth, scaled by GDP per capita, is somewhat more subdued at 0.3% per month. Overall, we can reject Hypothesis 1, as on average microfinance clients grow substantially between two consecutive loans.

In all countries the mean growth rate is higher than the median growth rate. This suggests that some clients show exceptionally high growth rates. Sales growth varies substantially as indicated by large standard deviations. Moreover, despite excluding loans that represent the 1<sup>st</sup> and 99<sup>th</sup> percentile of sales growth, the range of outcomes is wide. For example, in Mozambique, the lowest growth rate recorded in the sample is -88% per month, while the highest monthly growth rate is 59%.

Monthly loan size growth is substantially higher than sales growth. This may indicate that clients increasingly support their activities by borrowed funds. Alternatively, the strong growth in loan size might reflect the “progressive lending” principle of microlending (Armendáriz and Morduch 2010, 143f.) according to which the successful establishment of a lending relationship is rewarded by granting larger loans in the future.

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<sup>18</sup> In addition to agriculture, other sectors include manufacturing and construction.

Median employment growth of clients is zero in all countries, and only in Congo clients record a positive mean employment growth. This is in line with most business growth studies suggesting that small firms barely contribute to employment (Mandelman and Montes-Rojas 2009) and may even shed labour in the course of the growth process thereby increasing efficiency and productivity (Karlan and Morduch 2009).

The bulk of the loans represent loans for working capital purposes, a key feature of microfinance. The maximum share of loans used to finance the acquisition of fixed assets is 7% in Congo. The average loan maturity is quite similar across countries and amounts to 8-9 months. The time period between repayment of a loan and receiving the next loan is – on average – short and amounts to less than two months in Mozambique and Ghana. In Congo, on average a new loan is even granted before the end of the maturity of the previous loan. Interest rates are high, as it is typical for microfinance loans (Rosenberg et al. 2009) and lie in a range between 32% p.a. in Congo and 43% p.a. in Mozambique. Differences in interest rates reflect different loan sizes, i.e larger loans carry *ceteris paribus* a lower interest rate, but also the differences in the currency denomination of loans. In Mozambique and Ghana loans are disbursed in local currency while loans in Congo are USD denominated. Finally, there are more clients with a longer lending relationship (in terms of number of loans received) in Mozambique compared to Ghana and Congo, as operations in Mozambique have been running for a substantially longer period than in Ghana and Congo. In line with this, the average experience of a loan officer in terms of loans granted is also higher in Mozambique than in Ghana and Congo.

Table 2 displays the correlation matrix of Mozambique with pair-wise correlations.<sup>19</sup> It reveals a significantly negative relation between the initial level of sales and sales growth, i.e. smaller firms exhibit higher growth rates than larger firms. This is in line with findings of the empirical growth literature. Moreover, the growth rate of sales recorded after the first loan is significantly larger than growth rates after each successive loan. There is also negative correlation between sales growth and loan maturity and the length of the period between two consecutive loans, respectively. The latter suggests that businesses showing strong growth are more eager to take a new loan than clients with more subdued sales developments.<sup>20</sup> There is also a negative correlation between loan officer experience and sales growth, supporting the view of rising risk aversion of loan officers over time. Finally, the correlation matrix suggests that the relationships between the independent variables and sales growth and loan size growth respectively, are qualitatively similar. By contrast, we barely find significant correlations between employment growth and the independent variables. Exceptions are positive correlations between employment growth and loan maturity and other sectors, respectively, and a negative correlation between employment growth and trade businesses.

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<sup>19</sup> The correlation matrices of Ghana and Congo are not shown here but are available by the authors on request. All results referred to above hold in all countries under review.

<sup>20</sup> Degryse et al. (2012) present evidence according to which growing firms increase their debt position.

Univariate tests provide further evidence that the rate of sales growth is negatively related to firm size. We divide our sample into quartiles according to the initial level of sales, i.e. the level of sales when the first loan application is approved. The first quartile contains the firms with smallest initial sales and the fourth quartile the firms with the highest initial level of sales. In the beginning of the lending relationship, firms with the smallest initial sales record higher sales growth compared to firms in the quartile with the highest level of initial sales. In Mozambique, sales growth scaled by per capita GDP, of the smallest clients increases by more than 3% per month after the first loan, while the respective growth rate for the largest clients amounts to 0.4% p.m. only (Figure 1). This difference is significant according to a standard t-test. Assuming that firms with lower sales are less capital intensive than firms with a comparatively higher sales level this is in line with standard economic theory.<sup>21</sup>

In the course of the lending relationship differences in growth rates between the first and fourth quartile of clients remain significant up to the fifth loan but decline substantially as growth rates tend to converge to zero, i.e. the growth rate of GDP per capita (Table 3).<sup>22</sup> The latter is in line with standard economic theory and with the results of the business growth literature suggesting that early firm growth, for surviving firms, is above average but tappers off over time.<sup>23</sup> In the long run the rate of growth of sales is the same as the rate of growth of per capita income.

Finally, there is a significant difference between smaller and larger clients with regard to the length of the lending relationship (Table 4). Clients who belong to the group with the lowest level of initial sales are less likely to receive a third, fourth or fifth loan than clients who initially show a level of sales that represents the fourth quartile. Results of a chi-squared test show that the difference between the number of clients in the first and the fourth quartile who enter into a lending relationship involving more than two loans is significant. The difference may reflect voluntary drop outs by smaller clients (no need for further loans as retained earnings are high and/or investment opportunities are low, migration to other financial institutions that offer better conditions) or a decision by the lender to end the lending relationship.

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<sup>21</sup> Similar evidence can be observed in Ghana and Congo. It is available from the authors on request.

<sup>22</sup> In Ghana and Congo growth differences between clients in the first and fourth quartile show a higher degree of persistence. Hence, they do not converge in the course of the lending relationship like in Mozambique.

<sup>23</sup> We find similar results for all countries (available from the authors on request) replacing sales growth by loan size growth. By contrast, employment growth is not significantly linked to the initial size of clients measured by business sales.

## 5. Methodology

We follow the firm growth literature (e.g. Hashi and Besnik 2011) and use a linear pooled regression model to test whether client growth is related to (1) the initial size of the business, (2) the length of the lending relationship, and (3) other business, borrower and loan characteristics.

The linear regression model has the following form

$$Y_{in} = \beta_1 + \beta_2 Initial\_Sales_i + \beta_3 Initial\_Sales_i^2 + \beta_4 L_{in} + \beta_5 X_{in} + \beta_7 O_{in} + \beta_8 E_{in} + \varepsilon_{in}$$

The independent variable  $Y_{in}$  stands for the monthly growth rate of sales in the period that precedes the disbursement of the  $n$ th loan to client  $i$ . The variable  $Initial\ Sales_{in}$  captures the firm size at the beginning of the lending relationship. As expressed in Hypothesis 2, we expect that firms with a smaller initial level of sales exhibit faster sales growth. However, there might be a non-linear relationship between initial sales and sales growth, for example due to economies of scale effects with comparatively large businesses recording higher sales growth than smaller firms. Thus, we also control for  $Initial\ Sales_{in}^2$ . Alternatively, we control for the initial size of the client by introducing four dummy variables that are set to 1 if a client's initial level of sales is in the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> or 4<sup>th</sup> quartile. We test whether growth rates are significantly different for clients in the upper quartiles compared to the group of clients that initially show the lowest level of sales. We expect that the latter group shows a significantly higher growth rate.

Growth rates are likely to decline in the course of the lending relationship (Hypothesis 3). We test for this relationship by controlling for the length of the lending relationship in terms of loan number,  $L_{in}$ , the respective growth rate of sales by client  $i$  is associated with. We expect a negative coefficient as with each consecutive loan the marginal return to investment and hence the growth rate of sales should decline. Alternatively, and following Behr et al. (2011), we replace the variable  $L_{in}$  by dummy variables for each consecutive loan. For example, the dummy variable 3<sup>rd</sup> loan takes the value of 1 when the respective growth rate of sales was observed before client  $i$  received the third loan. This allows us to explore whether the relationship between business growth and the length of the lending relationship is non-linear, i.e. whether the decline in growth over time is more pronounced in the early stage of the lending relationship than in the later stage.

We combine the analysis of the growth effects of initial business size and length of the lending relationship by introducing interaction variables of initial sales and the loan number dummy variables. By doing this, we can explore whether the relationship between initial sales and client growth changes in the course of the lending relationship. Following up on the results of the univariate analysis we

expect that in the course of the lending relationship the level of initial sales becomes less relevant for the growth of sales clients record between two loans.

$X_{in}$  is a set of dummy variables for several loan and client characteristics. We control for loan use (distinguishing between fixed assets and working capital, with the dummy variable being 1 if a loan has been invested in fixed assets and 0 if it has been invested in working capital). There is no clear cut expectation on the sign of the coefficient. On the one hand, fixed asset financing should be associated with a higher growth rate as it allows for expanding the productive capacity of the business. On the other hand, a lack of working capital often represents a key constraint for micro and small enterprise growth, which suggests a negative coefficient. In addition we explore whether the economic sector the client operates in has an impact on growth (we differentiate between (retail) trade (the control group), services (transport, tourism/hospitality and others) and other economic sectors (agriculture, manufacturing and construction)). Following up on the firm growth literature we expect no robust results for the sector dummies (Hypothesis 4). We also control whether the client represents a legal entity. Given the growth disadvantages commonly associated with informality, we assume that legal entities and hence formalised firms show higher growth rates than sole proprietors (Hypothesis 3). Finally, we test whether growth rates differ with the number of persons living in the household of the client. The literature on family businesses in an African context suggests that a large family represents a disincentive for business growth (Khavul et al. 2009), as revenues have to be shared with the family as whole. Hence, we expect a negative coefficient.

In the baseline regression we refrain from testing for the influence of the interest rate the loan carries and the maturity of the loan. This is mainly due to substantial endogeneity concerns (see also Behr et al. 2011). On the one hand a lower interest rate and a longer loan maturity are likely to contribute to higher sales growth, as a lower interest rate reduces moral hazard effects (Stiglitz and Weiss 1981) and longer-term investments are associated with a higher profitability than short-term investments. On the other hand, the lenders might charge a lower interest and provide a loan with a longer maturity to clients with a more modest growth outlook.<sup>24</sup> Thus, the impact of both variables is from a theoretical perspective ambiguous.

In regressions that are limited to sole proprietorships we also control for age, gender and marital status of the client. We expect, again mainly due to the evidence provided by firm growth studies that young and male clients show higher business sales growth than old and female clients (hypotheses 2 and 5).<sup>25</sup>

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<sup>24</sup> This assumes that lenders can price discriminate among borrowers. The empirical literature (for an overview see Cerquero, G. et al. 2009) suggests that a bank's ability of price discrimination is negatively related to the presence of competitors in the vicinity. While competition in microfinance has increased over the last years (Assefa et al. 2012), it can be assumed that – in particular in the first years of their operations – the institutions reviewed were able to discriminate among borrowers

<sup>25</sup> Mead and Liedholm (1998) find that female borrowers are more risk averse than male borrowers.

On marital status, there are no strong priors. On the one hand, single clients can be expected to engage in more risky projects which should be associated with higher growth. However, Honig (1998) – interpreting marriage in a local context as a signal that the respective informal microentrepreneurs are serious and (comparatively) wealthy – finds that married microentrepreneurs show higher profits.

$O_{in}$  is a variable that captures the experience of the loan officer, measured by the number of loans the loan officer has handled until the date when the  $n$ th loan is approved. A more experienced loan officer can be assumed to be in a better position to assess the growth potential of clients than an inexperienced loan officer. If the focus were on clients with growth potential, this would imply a positive coefficient. However, the results by Behr et al. (2011) indicate that loan officers' risk aversion rises when they become more experienced. As risk and return are positively correlated this would lead to the expectation of a negative coefficient. Hence, the sign of the coefficient is largely an empirical matter. Finally,  $E_{in}$  controls for the length of the time period between the repayment of the previous loan and the approval of the subsequent loan. As access to a loan allows clients to realize investment opportunities the variable should have a negative coefficient. As we are unable to determine whether the length of the period between two loans is supply or demand driven, it should be stressed that a negative coefficient might reflect an endogenous response by the client to a more subdued growth outlook.

We use robust standard errors, clustered on client level to address potential heteroscedasticity. To pick up any systematic differences between sub-periods we include monthly-fixed effects in all our estimation models. Finally, we control for the respective branches of the institutions a loan was issued at.

As already indicated we run the same regressions replacing the growth rate of sales by the growth rate of loan size and employment as dependent variables, respectively. Moreover, we perform quantile regressions. This is motivated by the results of the empirical business growth literature suggesting that on average firms show only modest growth or no growth at all. Thus, from a policy perspective it might be more relevant to analyse growth patterns of the high growth firms. Moreover, the drivers of growth for those high growth firms may be different than the drivers of growth of the average growth firm (see e.g. Coad and Rao 2008). Accordingly, we test whether our results differ when focusing on high-growth clients.

## **6. Results**

### ***Baseline results***

Our baseline results are reported in Table 5. We find strong evidence that the growth rate of sales between two loans is significantly higher for clients who initially, i.e. when they receive the first loan, have a low level of sales. Put differently: Micro businesses show the highest growth rates of sales,



confirming hypothesis 2. However, in Mozambique and Congo the relationship between *Initial Sales* and sales growth is non-linear as the squared initial sales term is significantly positive. This may indicate that economies of scale effects counteract the negative effect of an increasing client size on growth. However, even for the largest clients the combined effect remains negative.

Results also show that clients record the highest growth rate after the disbursement of the first loan they receive. *Loan number* is significant and negative. In Mozambique and Ghana the growth rate of business sales declines by 0.3 percentage points per month for each consecutive loan (Congo: 0.5 percentage points). This is of economic significance given that on average the growth rate of sales is 1 percent per month in Mozambique (0.3 percent in Ghana and 1.5 percent in Congo). At the same time, it should be noted that this result does not imply that clients do not record sales growth when they receive their fourth or fifth loan. However, *on average* the growth rate of sales decline in the course of the lending relationship, confirming hypothesis 3 as well as the results of the univariate analysis. The evidence is also in line with expectations as marginal returns on investment should fall and hence growth rates of sales should go down in the course of the lending relationship, if – as it is the case – businesses grow over time. Moreover, it suggests that a major result of the business growth literature also holds for microfinance clients: without innovations small firms reach an equilibrium size level and stop growing, i.e. most clients remain small (and poor) even if they successfully enter into a relationship with the lender.

Replacing *Loan number* by dummy variables that distinguish between each consecutive loan leads to the result that the growth rate of sales peaks after the first loan. After the second loan growth rates drop, and the drop is most pronounced in the period between the second and third loan. Overall results confirm our expectations and the evidence depicted in Figure 1. Thus, the growth opportunities clients realize are the largest when they enter the lending relationship. Finally, we find for all countries that a shorter period between two consecutive loans is associated with a significantly higher growth rate of sales. Again, this is in line with expectations.

For the remaining variables we get significant results as well. However, they are not robust across countries. There is one variable where we find significant coefficients with opposing signs: In Mozambique growth rates of sales are significantly higher when the preceding loan was granted for the purpose of financing the acquisition of fixed assets, while in Ghana and Congo working capital loans are associated with a significant better growth performance. Legal entities in Ghana and Congo show significantly higher growth rates than sole proprietorships whereas in Mozambique the coefficient is insignificant. In both cases, however, the results of Mozambique may reflect the small number of loans issued for fixed asset financing (about 1 percent of all loans) and the small number of loans issued to legal entities (0.5 percent of all loans). Thus, overall we get some support for

hypothesis 3 as sole proprietors, who largely operate in the informal sector, show lower growth rates than legal entities. In Ghana and Congo, but not in Mozambique, clients engaged in trade show significantly higher growth rates of sales than clients operating in the service and other sectors. This contrasts with our expectation laid down in hypothesis 4 that the sector of activity has no significant influence in explaining growth patterns of firms. At the same time, it is in line with the experience of microfinance practitioners that trade clients engaged in petty trade offer a potential for high growth. Finally, our results confirm hypothesis 6. Microfinance client growth is characterised by a high degree of randomness as indicated by an  $R^2$  that hovers around 20 percent.

### ***Initial sales classes***

The results of the baseline regression barely change when we control for the initial size of clients by introducing dummy variables (*Class*) that group clients in four quartiles according to the level of sales when applying for the first loan. We find for all countries that growth rates between two loans are negatively related to the initial sale level, i.e. clients grouped in the quartiles 2-4 record on average a lower growth rate of sales than the smallest clients (representing the omitted reference category). Moreover, the negative coefficient increases in value with each consecutive group. Thus, results confirm the findings of the baseline regression that the growth rate of sales between two loans is negatively linked to the initial size of operations clients are engaged in: poorer clients show higher growth. The grouping in classes according to the initial level of sales has no material impact on sign and significance of the remaining explanatory variables. Most importantly, we find again that sales growth rates recorded between two loans decline for each subsequent loan until the sixth loan.

### ***Interaction between initial sales and loan number***

We add to the baseline regression an interaction term that links *Initial business sales* with the *loan number dummies* (Table 7). Thus, we test whether the negative relationship between initial sales and sales growth remains unaffected in the course of the lending relationship. In Mozambique and to a certain extent in Congo, results show that with each consecutive loan the growth disadvantage of larger clients becomes significantly less pronounced. For Mozambique, this supports the results obtained in the descriptive statistics (Figure 1, Table 3), namely that over time growth differences among clients with originally different size vanish with each subsequent loan. By contrast, results for Ghana indicate that the growth disadvantage of larger clients persists in the course of the lending relationship. Among clients that have received their fifth loan the growth rate of sales is still significantly higher for those clients that initially had a lower level of sales. All other coefficients remain basically unchanged in terms of sign and significance. A major exception is the “legal entity” variable which has now a significant positive coefficient in Mozambique like in the other countries.<sup>26</sup>

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<sup>26</sup> We also run a specification interacting the legal entity dummy with the initial sales variables (*Initial\_Sales* and *Initial\_Sales<sup>2</sup>*) and the loan number dummies. Thus, we test whether the growth pattern of legal entities differs

### ***Maturity and interest rate***

We add to the baseline regression the variables *maturity* and *interest rate* (Table 8). Loans with a longer maturity (in all countries) and a higher interest rate (in Mozambique and Ghana) are associated with a significantly lower growth of sales. With regard to loan maturity, we interpret the result as an endogenous response by the lenders with regard to clients' growth prospects by stretching loan maturities resulting in a cash flow surplus that allows clients to service the loan via monthly instalments. The negative interest rate effect is in line with moral hazard considerations which suggest that a too high interest rate may reduce clients' efforts and hence business growth. Finally, including *maturity* and *interest rate* in the regression does not lead to any qualitative changes for the other variables.

### ***Borrower characteristics***

Finally, we limit our sample to clients that run their business as a sole proprietorship. Thus, we exclude all clients that are legal entities. This allows us to rerun the baseline regression with more controls, namely gender, marital status and age of the client (Table 9). Inclusion of those variables and the smaller sample size does not lead to any qualitative changes of our major results: clients with lower level of initial sales grow faster and growth rates decline with each subsequent loan.

For the client characteristics as such, we find significant effects for each country but no robust effects across countries. Women borrowers record significantly lower growth rates in Mozambique, but not in Ghana and Congo. Thus, we are unable to confirm hypothesis 5 and the related evidence of the empirical business growth literature that businesses run by women are less dynamic. At the same time, our results do not indicate either that microfinance should place special emphasis on women borrowers, if the focus is on growth of the clients' businesses.

Married borrowers and borrowers with other family status show higher growth than single clients in Mozambique and Congo, but not in Ghana. Finally, client age has a significantly negative impact on growth in Mozambique and Congo. Assuming that client age is highly correlated with the age of the business, this result confirms hypothesis 2. However, it is not robust, as the respective coefficient is insignificant in Ghana.

## **7. Robustness checks**

We conduct two major robustness checks. First, we test whether our results hold when we replace business sales growth with loan size or employment growth (Tables 10 – 14). Second, we estimate

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significantly from the growth pattern of sole proprietors. We do not find such evidence. For Ghana results suggest that legal entity clients record a significantly more pronounced decline in growth rates in the course of the lending relationship. Results are available from the authors on request.

quantile regressions, i.e. we test whether the determinants of growth are different for high-growth clients compared to low-growth clients (Tables 15 – 17).

#### *Loan size growth, employment growth*

The first striking result when employing loan size growth and employment growth as dependent variables is the extremely low explanatory power of all regressions that aim at explaining employment growth. This is in line with expectations given the evidence compiled in the business growth literature that on average small businesses rarely increase the number of people employed leading to the indivisibilities in employment growth discussed before. By contrast, the explanatory power of the regression rises, in particular for Ghana and Congo, when opting for loan size growth instead of sales growth as the dependent variable. Again, this was expected as the measurement of loan size – in contrast to sales – does not face the challenges of properly assessing business data of informal, micro businesses.

Focusing on the regressions that aim at explaining loan size growth results for the baseline regression (Table 10) are similar to those obtained for sales growth. For example, we again find a non-linear relationship between loan growth and initial loan size. Moreover, the growth rate of loans declines in the course of the lending relationship and with a longer period without a loan contract. Finally, in Ghana and Congo (but not in Mozambique) legal entities and traders show higher loan growth rates than sole proprietors and clients operating in other sectors – a pattern that is also observed for sales growth.

Somewhat different than in the sales growth estimation but not surprising is the result that in all countries loans used for fixed asset financing are linked to higher loan growth rates. Moreover, there is conflicting evidence on the direction in which loan officer experience influence loan growth rates: in Mozambique loan growth rates decline when loan officers are more experienced, while the opposite result holds for Ghana and Congo. In general, those similarities and differences also hold for the estimations that control for the initial loan size by dividing the sample into quartiles according to initial loan size and employing the respective dummy variables (Table 11), control for interaction variables that link loan number with the initial loan size (Table 14), and control for borrower characteristics (Table 13, for the sole proprietor samples only). In the latter estimation, however, borrower characteristics like gender, marital status and age do not play any significant and robust role in explaining loan size growth. This contrasts with our results obtained for sales growth, where we found some evidence, albeit not robust, that young and married sole proprietors record higher sales growth than old and single clients. Finally, when controlling for the maturity and the interest rates of loans we find that a higher interest rate is associated with stronger loan growth in Mozambique and Congo, contradicting the result of the sales growth estimation where a higher interest rate is linked to

slower sales growth (Table 12). The result may reflect the progressive lending principle, as smaller loan sizes are linked to higher interest rates and loan sizes increase in the course of the lending relationship.

For employment and employment growth we find that the inverse non-linear relationship between initial size (measured by the number of employees) and employment growth. Larger businesses record higher employment growth. However, the effect is marginally countered by a negative coefficient for initial employment squared. The latter result is in line with evidence compiled by earlier studies on microfinance clients' employment patterns suggesting that clients may use the access to finance to improve efficiency which may also lead to labour shedding. However, it has to be mentioned that the economic significance is rather low as most clients just have one employee, the respective owner. For this reasons we also do not run the estimation for employment growth dividing the sample in quartiles according to initial employment as the median number of initial employment in Mozambique and Ghana is one. All other variables – with the exception of the “Time without contract variable“ – are either insignificant or are not robustly linked to employment growth across the countries. This also holds for the sector dummies, suggesting that clients engaged in trade lose their growth advantage when growth is measured by number of employees. Finally, there is basically no significant pattern of employment growth in the course of the lending relationship.

#### *Quantile regression*

The quantile regressions show that the relationships between initial client size, growth and loan number found in the baseline regression (Table 5) are more pronounced when clients experience high growth rates of sales. In all countries the non-linear relationship between initial level of sales and the growth rate of sales is most pronounced for the quantile of loans that are associated with the highest growth rates of clients. Indeed, loans associated with the poorest growth performance of clients show a linear, weakly negative relationship between the initial level of sales and the growth rate of income. This suggests that even the limited economies of scale effects that might explain the positive coefficient for initial sales squared for high growth clients cannot be observed for this client group. Overall results also indicate that in all countries the decline in growth rates for consecutive loans is most pronounced for the quantile of loans associated with the highest growth rates. Finally, a longer time period between two consecutive loans is associated with the largest growth losses for the loans that show the highest growth rates. Again, this holds for all countries.

Results also show that the positive growth impact of legal entity in Ghana and Congo is associated with high growth clients. This lends some support for the view that clients operating as formalized businesses are key if lenders aim at fostering client growth. However, the result is not robust as in Mozambique being a legal entity is positively associated with growth for the low growth clients.

There is also some evidence that the growth lead of trade companies vanishes among high growth clients (Ghana and Congo). In Mozambique companies engaged in other sectors are even found to make a positive contribution to growth among high growth clients. We interpret those results as weak support for Hypothesis 4, according to which engaged in trade or services do not dominate the high growth sample of clients.

Overall, the results of the quantile regressions are in line with the anecdotal evidence presented by microfinance practitioners. There are some clients that start out with a low level of sales and record extremely high growth rates. Moreover, there is some, albeit weak and non-robust evidence that favors recent tendencies within the microfinance industry to focus more on small businesses (Glisovic and Martinez 2012) as legal entities and companies operating in the non-trade sectors seem to provide a stronger impetus for growth among the high-growth clients than for growth of the average client.

## **8. Conclusion**

This paper aims at exploring the growth patterns of microfinance clients in three Sub-Saharan African countries. Motivated by the ongoing debate about the usefulness of microfinance as a development tool and employing an approach developed in the business growth literature we analyze data on the growth of some 40,000 microfinance clients between two consecutive loans. For sales growth, scaled by GDP per capita growth, we find robust evidence that on average clients show substantial growth between two consecutive loans. Moreover, there is a non-linear relationship between initial client size and growth: smaller businesses show higher growth rates which is marginally counteracted by positive growth of the very large clients. Results also indicate that growth rates decline in the course of the lending relationship. We also find, albeit not in all countries that on average clients engaged in trade and operating as legal entities record higher growth rates. By contrast, the gender of the client does not play a significant role in explaining differences in growth patterns. Finally, growth patterns of microfinance clients are characterised by a high degree of randomness.

We check the robustness of our results by replacing sales growth by loan size growth and employment growth, respectively, as our dependent variable. For loan size growth results largely confirm the findings we get for sales growth to a significant extent. By contrast, we observe that employment growth is on average zero and that the few statistically significant variables provide little mileage in explaining employment growth patterns.

How do our results relate to the two strands of literature our paper is based upon? With regard to the business growth literature our results are in line with many stylized facts that have emerged from a series of studies on the growth performance of businesses that are substantially larger and operating in

a much more formal environment than microfinance clients. Thus, with the possible exception of the evidence indicating that traders show significantly higher growth than clients engaged in other sectors, our results suggest that the main difference between micro and other businesses is size. The growth patterns as such seem to be similar. This result should be challenged by analyses of the growth experience of microfinance clients in other regions served by other (types of) lenders.

With regard to the microfinance debate on impact, strictly speaking our results do not provide any insights as we do not conduct an impact study. Having said this, they do provide some comfort for microfinance practitioners who – confronted with a debate about the usefulness of microfinance as a development tool – insist that their experience on the ground suggests that clients on average grow. At the same time, by stressing the similarity with growth patterns of other businesses, the evidence presented in this paper shows that for the average client strong growth is a short-run phenomenon. Clients get the opportunity – if succeeding – to reach “the optimal size” (Beck et al. 2006) of their business activity. But for the average client this optimal size is small.

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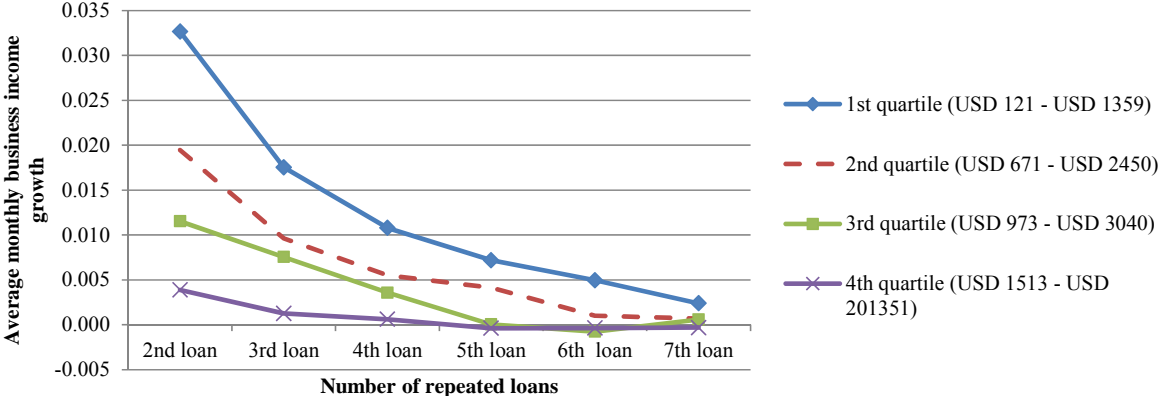
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**Figure 1: Average monthly sales growth, classified by size of initial sales and scaled by GDP per capita - Mozambique**

This figure illustrates the monthly sales growth patterns classified by size of Initial sales. The first quartile include firms with the smallest initial sales and the fourth quartile firms with the highest initial business income.



**Table 1a: Descriptive statistics - Mozambique**

This table reports summary statistics of all dependent and explanatory variables.

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Median</b>	<b>Min</b>	<b>Max</b>	<b>N</b>
<i>Business characteristics</i>						
Monthly sales growth (in %)	0.010	0.038	0.006	-0.876	0.592	44,571
Monthly loan size growth (in %)	0.034	0.063	0.027	-0.327	0.963	43,555
Monthly employment growth	-0.001	0.081	0.000	-0.476	0.488	43,703
Log initial sales scaled	1.493	0.713	1.380	-1.013	6.153	44,571
Log initial sales scaled_squared	2.737	2.871	1.904	0.000	37.862	44,571
Log initial loan size	-0.043	0.767	-0.185	-1.667	4.313	41,633
Log initial loan size_squared	0.590	1.126	0.260	0.000	18.600	41,633
Initial employment	1.720	5.612	1	1	665	44,571
Initial employment_squared	34.454	3,002.794	1	1	442,225	44,571
Legal entity	0.005	0.073	0	0	1	44,571
Individual	0.995	0.073	1	0	1	44,571
Trade	0.829	0.376	1	0	1	44,571
Services	0.044	0.206	0	0	1	44,571
Other sectors	0.126	0.332	0	0	1	44,571
<i>Loan characteristics</i>						
Loan number	3.306	1.441	3	2	7	44,571
2nd loan	0.399	0.490	0	0	1	44,571
3rd loan	0.244	0.429	0	0	1	44,571
4th loan	0.154	0.361	0	0	1	44,571
5th loan	0.099	0.299	0	0	1	44,571
6th loan	0.063	0.244	0	0	1	44,571
7th loan	0.041	0.197	0	0	1	44,571
Experience (No. of loans handled)	353.290	310.306	275	0	1713	44,571
Fixed assets	0.010	0.099	0	0	1	44,571
Working capital	0.990	0.099	1	0	1	44,571
Time without contract (in months)	1.637	9.636	-0.721	-58.585	114.885	44,571
Maturity (n-1) (in months)	8.070	2.560	8	1.4	60	44,571
Interest rate (n-1) (in %)	0.433	0.044	0.434	0.119	0.778	44,571
<i>Personal characteristics</i>						
(Initial) age	38.134	8.599	37.844	18.211	75.1	44,261
Female	0.633	0.482	1	0	1	44,333
Male	0.367	0.482	0	0	1	44,333
Single	0.242	0.428	0	0	1	44,333
Married	0.190	0.392	0	0	1	44,333
Other family status (divorced, widowed)	0.063	0.243	0	0	1	44,333
Accompanied	0.505	0.500	1	0	1	44,333
No. of persons per household	5.141	2.078	5	0	87	44,571

Source: authors' compilation

**Table 1b: Descriptive statistics – Ghana**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Median</b>	<b>Min</b>	<b>Max</b>	<b>N</b>
<i>Business characteristics</i>						
Monthly sales growth (in %)	0.003	0.030	0.003	-0.817	0.458	26,345
Monthly loan size growth (in %)	0.019	0.038	0.017	-0.622	0.602	26,067
Monthly employment growth	-0.001	0.068	0.000	-0.517	0.400	25,836
Log initial sales scaled	0.833	0.960	0.776	-2.518	6.534	26,345
Log initial sales scaled_squared	1.616	2.381	0.750	0.000	42.695	26,345
Log initial loan size	-0.253	0.926	-0.367	-2.602	3.71	26,345
Log initial loan size_squared	0.9219	1.201	0.4798	0.000	13.798	26,345
Initial employment	1.901	4.876	1	1	201	26,345
Initial employment_squared	27.395	641.729	1	1	40,401	26,345
Private entity	0.222	0.416	0	0	1	26,335
Individual	0.777	0.416	1	0	1	26,335
Trade	0.730	0.444	1	0	1	26,345
Other services	0.197	0.398	0	0	1	26,345
Other sectors	0.073	0.260	0	0	1	26,345
<i>Loan characteristics</i>						
Loan number	2.902	1.163	3	2	7	26,345
2nd loan	0.498	0.500	0	0	1	26,345
3rd loan	0.263	0.441	0	0	1	26,345
4th loan	0.134	0.340	0	0	1	26,345
5th loan	0.061	0.240	0	0	1	26,345
6th loan	0.030	0.170	0	0	1	26,345
7th loan	0.014	0.116	0	0	1	26,345
Experience (No. of loans handled)	180.497	135.735	154	0	716	26,345
Fixed assets	0.037	0.190	0	0	1	26,345
Working capital	0.963	0.190	1	0	1	26,345
Time without contract (in months)	0.218	5.476	-0.844	-40.569	70.164	26,345
Maturity (n-1) (in months)	9.794	2.027	10	1	40.567	26,345
Interest rate (n-1) (in %)	0.395	0.043	0.405	0.145	2.403	26,345
<i>Client characteristics</i>						
Initial age (in years)	39.414	8.190	38.586	18.861	80.817	20,421
Female	0.726	0.446	1	0	1	20,470
Male	0.274	0.446	0	0	1	20,470
Single	0.101	0.301	0	0	1	20,405
Married	0.779	0.415	1	0	1	20,405
Other family status (divorced, widowed)	0.117	0.322	0	0	1	20,405
Accompanied	0.003	0.052	0	0	1	20,405
No. of persons per household	1.801	1.625	2	0	36	26,345

**Table 1c: Descriptive statistics – Congo**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Median</b>	<b>Min</b>	<b>Max</b>	<b>N</b>
<i>Business characteristics</i>						
Monthly sales growth (in %)	0.015	0.029	0.013	-0.281	0.168	16,337
Monthly loan size growth (in %)	0.033	0.034	0.033	-0.227	0.301	16,102
Monthly employment growth	0.010	0.091	0.000	-0.407	0.573	16,021
Log initial sales scaled	3.390	1.044	3.274	0.004	9.297	16,337
Log initial sales scaled_squared	12.580	7.954	10.716	0.000	86.434	16,337
Log initial loan size	1.790	1.189	1.613	-0.341	4,929	16194
Log initial loan size_squared	4.619	5.176	2.602	0.000	24,301	16194
Initial employment	3.478	7.621	2	1	263	16337
Initial employment_squared	70.176	1,174.961	4	1	69,169	16337
Private entity	0.219	0.414	0	0	1	16,327
Individual	0.781	0.414	1	0	1	16,327
Trade	0.893	0.310	1	0	1	16,337
Other services	0.052	0.221	0	0	1	16,337
Other sectors	0.056	0.230	0	0	1	16,337
<i>Loan characteristics</i>						
Loan number	2.759	0.991	2	2	7	16,337
2nd loan	0.529	0.499	1	0	1	16,337
3rd loan	0.273	0.445	0	0	1	16,337
4th loan	0.130	0.336	0	0	1	16,337
5th loan	0.051	0.220	0	0	1	16,337
6th loan	0.015	0.122	0	0	1	16,337
7th loan	0.003	0.051	0	0	1	16,337
Experience (No. of loans handled)	156	116	132	0	586	16,337
Fixed assets	0.071	0.256	0	0	1	16,337
Working capital	0.929	0.256	1	0	1	16,337
Time without contract (in months)	-0.351	5.035	-1.377	-41.603	51.410	16,337
Maturity (n-1) (in months)	9.595	2.274	9	5	36	16,337
Interest rate (n-1) (in %)	0.316	0.041	0.328	0.090	0.596	16,333
<i>Client characteristics</i>						
Initial age (in years)	40.639	8.287	40.006	18.742	78.097	12,751
Female	0.523	0.500	1	0	1	12,752
Male	0.477	0.500	0	0	1	12,752
Single	0.096	0.294	0	0	1	12,752
Married	0.776	0.417	1	0	1	12,752
Other family status (divorced, widowed)	0.127	0.333	0	0	1	12,752
Accompanied	0.001	0.031	0	0	1	12,752
No. of persons per household	3.070	2.652	3	0	54	16,337

**Table 2: Correlation matrix** (\* denotes significance at the 0.05 level)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Sales growth	1																
2 Loan size growth	0.4090*	1															
3 Employment growth	0.0555*	0.0415*	1														
4 Initial sales	-0.1331*	-0.0345*	0.0067	1													
5 Initial sales_squared	-0.1136*	-0.0359*	0.009	0.9460*	1												
6 Initial loan size	-0.0149*	-0.0820*	0.0183*	0.7224*	0.6970*	1											
7 Initial loans size_squared	-0.0263*	-0.0516*	0.0244*	0.4057*	0.5279*	0.5409*	1										
8 Initial employment	-0.0056*	-0.0063*	0.0112*	0.1314*	0.1480*	0.1294*	0.1403*	1									
9 Initial employment_squared	-0.0013	0.0036*	0.0004	0.0058*	0.0056*	-0.0022	0.0057*	0.8640*	1								
10 Loan number	-0.1527*	-0.1841*	0.003	-0.0668*	-0.0527*	-0.1634*	-0.0308*	-0.0035*	-0.0049*	1							
11 2nd loan	0.1515*	0.1945*	-0.0116*	0.0460*	0.0376*	0.1263*	0.0375*	0.0014	0.0025	-0.7383*	1						
12 3rd loan	-0.0187*	-0.0363*	0.0119*	0.0107*	0.0075	0.0160*	-0.0096*	0.0024	0.0037*	-0.1207*	-0.4626*	1					
13 4th loan	-0.0587*	-0.0781*	0.0013	-0.0099*	-0.0088	-0.0420*	-0.0178*	-0.0003	-0.0027	0.2052*	-0.3476*	-0.2421*	1				
14 5th loan	-0.0669*	-0.0800*	0.0045	-0.0273*	-0.0227*	-0.0683*	-0.0165*	-0.0025	-0.003	0.3901*	-0.2705*	-0.1884*	-0.1416*	1			
15 6th loan	-0.0623*	-0.0696*	-0.0012	-0.0317*	-0.0245*	-0.0757*	-0.0103*	-0.0018	-0.0023	0.4863*	-0.2121*	-0.1477*	-0.1110*	-0.0864*	1		
16 7th loan	-0.0497*	-0.0549*	-0.0047	-0.0389*	-0.0290*	-0.0788*	-0.0025	-0.0019	-0.0018	0.5275*	-0.1678*	-0.1168*	-0.0878*	-0.0683*	-0.0536*	1	
17 Loan officer experience	-0.0350*	-0.0578*	-0.0042	-0.0139*	-0.0236*	-0.0369*	-0.0326*	-0.0127*	-0.0028	0.0999*	-0.1048*	0.0177*	0.0415*	0.0468*	0.0396*	0.0261*	1
18 Fixed assets	0.0035	0.0048	0.0333*	0.0871*	0.0967*	0.1572*	0.1877*	0.0740*	0.0041*	0.0056	-0.0034	-0.0003	-0.0008	0.0012	0.0031	0.0049	-0.0160*
19 Working capital	-0.0035	-0.0048	-0.0333*	-0.0871*	-0.0967*	-0.1572*	-0.1877*	-0.0740*	-0.0041*	-0.0056	0.0034	0.0003	0.0008	-0.0012	-0.0031	-0.0049	0.0160*
20 Trade	-0.0180*	0.0073	-0.0109*	-0.0131*	-0.0226*	-0.1389*	-0.0961*	-0.0608*	0.0015	0.0358*	-0.0184*	-0.0111*	0.0028	0.0088	0.0182*	0.0288*	-0.0027
21 Services	0.0043	-0.0123*	-0.0024	-0.0569*	-0.0312*	0.0659*	0.0651*	0.0421*	0.0002	-0.0087	0.0042	0.0005	0.0009	0.0008	-0.0012	-0.0130*	-0.0154*
22 Other sectors	0.0177*	-0.0007	0.0138*	0.0502*	0.0449*	0.1164*	0.0682*	0.0428*	-0.0018	-0.0352*	0.0182*	0.0123*	-0.0037	-0.0105*	-0.0199*	-0.0245*	0.0126*
23 Time without contract	-0.1748*	-0.2890*	-0.0225*	-0.1224*	-0.0990*	-0.1188*	-0.0106*	-0.0191*	-0.0040*	0.0486*	-0.0475*	0.0033	0.0222*	0.0203*	0.0178*	0.0172*	-0.0151*
24 Legal entity	-0.009	-0.0224*	-0.001	0.2054*	0.2658*	0.2511*	0.4599*	0.1182*	0.0078*	-0.0241*	0.0208*	0.000009	-0.0074	-0.0099*	-0.009	-0.0120*	-0.0316*
25 Sole proprietorship	0.009	0.0224*	0.001	-0.2054*	-0.2658*	-0.2511*	-0.4599*	-0.1182*	-0.0078*	0.0241*	-0.0208*	-0.00009	0.0074	0.0099*	0.009	0.0120*	0.0316*
26 No. of persons per household	-0.0078	-0.0112*	0.0033	0.0272*	0.0064	-0.0079*	-0.0821*	-0.0097*	-0.0079*	0.0530*	-0.0438*	-0.0012	0.0125*	0.0231*	0.0230*	0.0250*	-0.0005
27 One-person business	-0.0215*	-0.0029	-0.3307*	-0.3028*	-0.2809*	-0.3317*	-0.1513*	-0.1637*	-0.0093*	0.0090*	0	-0.0059*	-0.0029	-0.0022	0.0059*	0.0140*	0.0255*
28 Several persons business	0.0215*	0.0029	0.3307*	0.3028*	0.2809*	0.3317*	0.1513*	0.1637*	0.0093*	-0.0090*	0	0.0059*	0.0029	0.0022	-0.0059*	-0.0140*	-0.0255*
29 Maturity	-0.1345*	-0.3083*	0.0187*	0.1654*	0.1767*	0.3552*	0.2697*	0.0735*	0	0.2660*	-0.2355*	0.0026	0.0837*	0.1158*	0.1173*	0.1055*	0.0115*
30 Interest rate	0.0201*	0.0464*	-0.0018	-0.4221*	-0.3883*	-0.3144*	-0.1515*	-0.0802*	-0.0023	0.0331*	-0.0309*	0.0094*	0.0065	0.0052	0.0082	0.0262*	0.0206*
31 Female	-0.0045	0.0061	-0.0034	-0.1053*	-0.0902*	-0.1501*	-0.0622*	-0.0373*	0.0035*	0.0233*	-0.0184*	-0.002	0.0077	0.0067	0.0103*	0.0130*	-0.0012
32 Male	0.0045	-0.0061	0.0034	0.1053*	0.0902*	0.1499*	0.0620*	0.0372*	-0.0035*	-0.0233*	0.0184*	0.002	-0.0077	-0.0067	-0.0103*	-0.0130*	0.0012
33 (Initial) age	-0.0183*	-0.0248*	0.0001	0.0223*	0.0244*	0.0514*	0.0244*	0.0234*	0.0075*	0.0195*	-0.0151*	-0.0047	0.0064	0.0116*	0.0119*	0.0034	-0.0054
34 Single	-0.0015	0.0112*	-0.0017	-0.0434*	-0.0350*	-0.0531*	-0.0117*	-0.0125*	-0.0019	-0.0317*	0.0271*	0.0003	-0.0082	-0.0152*	-0.0136*	-0.0130*	-0.0106*
35 Married	-0.008	-0.0236*	0.0037	0.0793*	0.0781*	0.1158*	0.0597*	0.0199*	-0.0037*	0.0366*	-0.0281*	-0.0023	0.006	0.0140*	0.0203*	0.0171*	0.0208*
36 Other family status	0.002	0.0017	-0.0002	0.0126*	0.009	0.0040*	-0.0056*	0.0033*	-0.0009	-0.002	0.0013	0.0008	0.001	-0.0031	-0.0035	0.0021	-0.0123*
37 Accompanied	0.0066	0.0081	-0.0014	-0.0312*	-0.0358*	-0.0480*	-0.0344*	-0.0065*	0.0049*	-0.0006	-0.0018	0.0012	0.0018	0.0035	-0.0026	-0.0034	-0.0013



	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
18 Fixed assets	1																			
19 Working capital	-1	1																		
20 Trade	-0.1413*	0.1413*	1																	
21 Services	0.1166*	-0.1166*	-0.4755*	1																
22 Other sectors	0.0877*	-0.0877*	-0.8378*	-0.0820*	1															
23 Time without contract	-0.0187*	0.0187*	0.0288*	0.0042	-0.0352*	1														
24 Legal entity	0.1114*	-0.1114*	-0.0805*	0.1231*	0.0148*	-0.0402*	1													
25 Sole proprietorship	-0.1114*	0.1114*	0.0805*	-0.1231*	-0.0148*	0.0402*	-1	1												
26 No. of persons per household	0.0028	-0.0028	-0.0018	-0.0548*	0.0361*	0.005	-0.1813*	0.1813*	1											
27 One-person business	-0.0924*	0.0924*	0.1487*	-0.1035*	-0.1042*	0.0762*	-0.0740*	0.0740*	0.0036*	1										
28 Several persons business	0.0924*	-0.0924*	-0.1487*	0.1035*	0.1042*	-0.0762*	0.0740*	-0.0740*	-0.0036*	-1	1									
29 Maturity	0.1202*	-0.1202*	-0.0695*	0.0764*	0.0314*	0.0566*	0.1649*	-0.1649*	-0.0068	-0.1341*	0.1341*	1								
30 Interest rate	-0.0661*	0.0661*	0.1038*	-0.007	-0.1133*	0.0536*	-0.1283*	0.1283*	-0.0251*	0.2438*	-0.2438*	-0.0738*	1							
31 Female	-0.0557*	0.0557*	0.1203*	-0.0366*	-0.1135*	0.0200*	*	*	-0.1005*	0.1315*	-0.1315*	-0.0371*	0.0615*	1						
32 Male	0.0557*	-0.0557*	-0.1203*	0.0366*	0.1135*	-0.0200*	*	*	0.1005*	-0.1315*	0.1315*	0.0371*	-0.0615*	-1.0000*	1					
33 (Initial) age	0.0015	-0.0015	-0.0447*	-0.0118*	0.0577*	-0.0082	*	*	0.0841*	-0.0144*	0.0144*	0.0390*	-0.0376*	0.0303*	-0.0303*	1				
34 Single	-0.0187*	0.0187*	0.0623*	0.0016	-0.0712*	0.0018	*	*	-0.1924*	0.0469*	-0.0469*	-0.0316*	0.0495*	0.2458*	-0.2458*	-0.0648*	1			
35 Married	0.0385*	-0.0385*	-0.0838*	0.0231*	0.0805*	0.0035	*	*	0.1177*	-0.0708*	0.0708*	0.0643*	-0.0870*	-0.0370*	0.0370*	0.1432*	-0.2736*	1		
36 Other family status	-0.0061	0.0061	-0.0016	-0.0071	0.0062	0.0009	*	*	-0.0591*	-0.0027	0.0027	-0.0043	-0.0252*	0.1490*	-0.1490*	0.1003*	-0.1468*	-0.1259*	1	
37 Accompanied	-0.0112*	0.0112*	0.0132*	-0.0160*	-0.0052	-0.0046	*	*	0.1012*	0.0167*	-0.0167*	-0.0213*	0.0382*	-0.2540*	0.2540*	-0.1057*	-0.5703*	-0.4891*	-0.2624*	1

**Table 3: Univariate analysis: Size of initial sales and average monthly sales growth rates - Mozambique**

Initial level of sales	Average sales growth rates						
	2nd loan	3rd loan	4th loan	5th loan	6th loan	7th loan	Total
1st quartile	0.033	0.018	0.011	0.007	0.005	0.002	0.022
2nd quartile	0.019	0.01	0.006	0.004	0.001	0.001	0.011
3rd quartile	0.012	0.008	0.004	0	-0.001	0.001	0.007
4th quartile	0.004	0.001	0.001	0	0	0	0.002
Difference in sales growth rates between the first and the fourth quartile	0.029***	0.016***	0.010***	0.008***	0.005**	0.003	0.021***

\*, \*\*, \*\*\* significant at the 0.10, 0.05 and 0.01 level.

**Table 4: Univariate analysis - Size of initial sales and number of approved loans over the course of the lending relationship - Mozambique**

Initial level of sales	Number of clients						
	2nd loan	3rd loan	4th loan	5th loan	6th loan	7th loan	Total
1st quartile	4426	2282	1213	673	376	204	9174
2nd quartile	4476	2788	1733	1111	682	450	11240
3rd quartile	4471	2882	1920	1297	829	525	11924
4th quartile	4425	2904	1991	1342	939	632	12233
Difference in the number of approved loans between the first and the fourth quartile (chi-squared test)	***	***	***	***	***	***	***

\*, \*\*, \*\*\* significant at the 0.10, 0.05 and 0.01 level)

**Table 5: Baseline results**

This table displays our baseline results, using a linear regression model. The dependent variable is monthly sales growth (log-diff), scaled by the GDP per capita of the respective year. In column 4, 5 and 6 the continuous variable ‘loan number’ is replaced by dummy variables. Reference category is the second granted loan. Reference category regarding the fixed assets dummy is ‘working capital’ and regarding the economic sector is ‘Trade’. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	Dependent variable: Sales growth					
	(1) Mozambique	(2) Ghana	(3) Congo	(4) Mozambique	(5) Ghana	(6) Congo
Initial sales	<b>-0.0222***</b> (0.000901)	<b>-0.00551***</b> (0.000316)	<b>-0.00961***</b> (0.00108)	<b>-0.0222***</b> (0.000899)	<b>-0.00548***</b> (0.000317)	<b>-0.00955***</b> (0.00108)
Initial sales <sup>2</sup>	<b>0.00279***</b> (0.000240)	0.0000533 (0.000139)	<b>0.000390***</b> (0.000139)	<b>0.00280***</b> (0.000240)	0.0000488 (0.000139)	<b>0.000386***</b> (0.000139)
Loan number	<b>-0.00302***</b> (0.000113)	<b>-0.00298***</b> (0.000134)	<b>-0.00499***</b> (0.000232)			
3 <sup>rd</sup> loan				<b>-0.00681***</b> (0.000433)	<b>-0.00463***</b> (0.000388)	<b>-0.00714***</b> (0.000515)
4 <sup>th</sup> loan				<b>-0.00930***</b> (0.000477)	<b>-0.00725***</b> (0.000451)	<b>-0.0108***</b> (0.000639)
5 <sup>th</sup> loan				<b>-0.0109***</b> (0.000549)	<b>-0.00943***</b> (0.000637)	<b>-0.0132***</b> (0.000952)
6 <sup>th</sup> loan				<b>-0.0121***</b> (0.000638)	<b>-0.0107***</b> (0.000798)	<b>-0.0199***</b> (0.00207)
7 <sup>th</sup> loan				<b>-0.0127***</b> (0.000808)	<b>-0.0117***</b> (0.00115)	<b>-0.0184***</b> (0.00356)
Loan officer experience	-0.000000590 (0.000000563)	0.000000631 (0.00000117)	<b>0.0000127***</b> (0.00000200)	-0.000000417 (0.000000562)	0.000000850 (0.00000117)	<b>0.0000131***</b> (0.00000200)
Fixed assets	<b>0.00983***</b> (0.00217)	<b>-0.00335***</b> (0.00107)	<b>-0.00428***</b> (0.00101)	<b>0.00991***</b> (0.00217)	<b>-0.00336***</b> (0.00107)	<b>-0.00415***</b> (0.00101)
Services	-0.00113 (0.000822)	<b>-0.00323***</b> (0.000438)	<b>-0.00835***</b> (0.00126)	-0.00105 (0.000821)	<b>-0.00323***</b> (0.000439)	<b>-0.00837***</b> (0.00126)
Other sectors	0.000448 (0.000513)	<b>-0.00449***</b> (0.000658)	<b>-0.00587***</b> (0.00120)	0.000457 (0.000513)	<b>-0.00448***</b> (0.000658)	<b>-0.00596***</b> (0.00120)
Time without contract	<b>-0.000730***</b> (0.0000169)	<b>-0.000770***</b> (0.0000296)	<b>-0.000923***</b> (0.0000406)	<b>-0.000723***</b> (0.0000169)	<b>-0.000765***</b> (0.0000296)	<b>-0.000914***</b> (0.0000404)
Legal entity	0.00493 (0.00318)	<b>0.00276***</b> (0.000524)	<b>0.00202***</b> (0.000714)	0.00500 (0.00317)	<b>0.00275***</b> (0.000523)	<b>0.00203***</b> (0.000714)
Number of persons per household	-0.00000572 (0.0000707)	0.000143 (0.000111)	<b>0.000177*</b> (0.000102)	0.00000229 (0.0000707)	0.000142 (0.000111)	<b>0.000174*</b> (0.000102)
Constant	<b>0.279**</b> (0.115)	<b>0.0235***</b> (0.00626)	<b>0.0732***</b> (0.00972)	<b>0.273**</b> (0.115)	<b>0.0175***</b> (0.00624)	<b>0.0630***</b> (0.00969)
Observations	44571	26335	16327	44568	26335	16327
R <sup>2</sup>	0.2027	0.2835	0.1672	0.2050	0.2843	0.1687

**Table 6: Initial sales classes**

This table displays our baseline results, using a linear regression model. The dependent variable is monthly sales growth (log-diff), scaled by the GDP per capita of the respective year. Four dummy variables are included, classified by the size of initial sales and scaled by GDP per capita. The reference category is the smallest initial sales class. Loan number dummies are included; reference category is the second granted loan. Loan use dummies are included; reference category is ‘working capital’. Economic sector dummies are included; reference category is ‘Trade’. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1) Sales growth Mozambique	(2) Sales growth Ghana	(3) Sales growth Congo
Class 2: Initial sales	<b>-0.0106***</b> (0.000460)	<b>-0.00546***</b> (0.000489)	<b>-0.00608***</b> (0.000617)
Class 3: Initial sales	<b>-0.0158***</b> (0.000484)	<b>-0.00964***</b> (0.000512)	<b>-0.0103***</b> (0.000627)
Class 4: Initial sales	<b>-0.0223***</b> (0.000537)	<b>-0.0143***</b> (0.000573)	<b>-0.0172***</b> (0.000711)
3rd loan	<b>-0.00594***</b> (0.000434)	<b>-0.00361***</b> (0.000388)	<b>-0.00665***</b> (0.000515)
4th loan	<b>-0.00751***</b> (0.000477)	<b>-0.00515***</b> (0.000458)	<b>-0.00969***</b> (0.000638)
5th loan	<b>-0.00820***</b> (0.000551)	<b>-0.00612***</b> (0.000650)	<b>-0.0115***</b> (0.000945)
6th loan	<b>-0.00862***</b> (0.000640)	<b>-0.00620***</b> (0.000812)	<b>-0.0177***</b> (0.00207)
7th loan	<b>-0.00822***</b> (0.000808)	<b>-0.00608***</b> (0.00118)	<b>-0.0149***</b> (0.00347)
Loan officer experience	-0.000000511 (0.000000560)	0.000000136 (0.00000117)	<b>0.0000120***</b> (0.00000201)
Fixed assets	<b>0.00917***</b> (0.00215)	<b>-0.00302***</b> (0.00106)	<b>-0.00336***</b> (0.001000)
Legal entity	-0.000651 (0.00294)	<b>0.00199***</b> (0.000515)	<b>0.00122*</b> (0.000713)
Services	-0.000409 (0.000850)	<b>-0.00294***</b> (0.000431)	<b>-0.00607***</b> (0.00121)
Other sectors	0.000374 (0.000517)	<b>-0.00421***</b> (0.000667)	<b>-0.00660***</b> (0.00117)
Time without contract	<b>-0.000624***</b> (0.0000169)	<b>-0.000672***</b> (0.0000292)	<b>-0.000863***</b> (0.0000405)
No. of persons per household	-0.0000335 (0.0000739)	0.000109 (0.000109)	0.000118 (0.000102)
Constant	<b>0.260**</b> (0.115)	<b>0.0208***</b> (0.00631)	<b>0.0442***</b> (0.00947)
Observations	44571	26335	16327
R <sup>2</sup>	0.1996	0.2860	0.1624

**Table 7: Interactions – number of loan and Initial sales**

The dependent variables are monthly sales growth (log-diff), scaled by the GDP per capita of the respective year. Loan number dummies are included, constant is omitted. Interactions between log initial sales and loan number dummies. Loan use dummies are included; reference category is ‘working capital’. Economic sector dummies are included; reference category is ‘Trade’. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1) Sales growth - Mozambique	(2) Sales growth - Ghana	(3) Sales growth - Congo
Initial sales	<b>-0.0299***</b> (0.000999)	<b>-0.00580***</b> (0.000398)	<b>-0.0103***</b> (0.00111)
Initial sales <sup>2</sup>	<b>0.00312***</b> (0.000235)	0.0000904 (0.000139)	<b>0.000389***</b> (0.000140)
3 <sup>rd</sup> loan	<b>-0.0176***</b> (0.00109)	<b>-0.00441***</b> (0.000551)	<b>-0.0102***</b> (0.00190)
4 <sup>th</sup> loan	<b>-0.0248***</b> (0.00121)	<b>-0.00859***</b> (0.000656)	<b>-0.0187***</b> (0.00235)
5 <sup>th</sup> loan	<b>-0.0305***</b> (0.00140)	<b>-0.00943***</b> (0.000805)	<b>-0.0202***</b> (0.00316)
6 <sup>th</sup> loan	<b>-0.0344***</b> (0.00152)	<b>-0.0116***</b> (0.000989)	<b>-0.0267***</b> (0.00744)
7 <sup>th</sup> loan	<b>-0.0357***</b> (0.00207)	<b>-0.0128***</b> (0.00145)	<b>-0.0215***</b> (0.00602)
3 <sup>rd</sup> loan*Initial sales	<b>0.00715***</b> (0.000702)	-0.000278 (0.000457)	<b>0.000927*</b> (0.000534)
4 <sup>th</sup> loan* Initial sales	<b>0.0104***</b> (0.000795)	<b>0.00174***</b> (0.000541)	<b>0.00234***</b> (0.000660)
5 <sup>th</sup> loan* Initial sales	<b>0.0135***</b> (0.000945)	-0.000120 (0.000693)	<b>0.00208**</b> (0.000903)
6 <sup>th</sup> loan* Initial sales	<b>0.0155***</b> (0.00100)	0.00178 (0.00112)	0.00206 (0.00246)
7 <sup>th</sup> loan* Initial sales	<b>0.0163***</b> (0.00152)	0.00275 (0.00169)	0.000984 (0.00194)
Loan officer experience	7.06e-08 (0.000000558)	0.000000817 (0.00000117)	<b>0.0000134***</b> (0.00000200)
Fixed assets	<b>0.0106***</b> (0.00214)	<b>-0.00341***</b> (0.00107)	<b>-0.00407***</b> (0.00101)
Legal entity	<b>0.00811***</b> (0.00307)	<b>0.00277***</b> (0.000523)	<b>0.00204***</b> (0.000715)
Services	-0.000827 (0.000819)	<b>-0.00325***</b> (0.000438)	<b>-0.00853***</b> (0.00127)
Other sectors	0.000795 (0.000509)	<b>-0.00452***</b> (0.000659)	<b>-0.00609***</b> (0.00120)
Time without contract	<b>-0.000712***</b> (0.0000167)	<b>-0.000766***</b> (0.0000296)	<b>-0.000911***</b> (0.0000405)
No. of persons per household	0.00000464 (0.0000716)	0.000150 (0.000111)	<b>0.000180*</b> (0.000102)
Constant	<b>0.284**</b> (0.115)	<b>0.0178***</b> (0.00624)	<b>0.0657***</b> (0.00974)
Observations	44571	26335	16327
R <sup>2</sup>	0.2159	0.2848	0.1696

**Table 8: Endogenous variables ‘maturity<sub>n-1</sub>’ and ‘interest rate<sub>n-1</sub>’**

The dependent variable is monthly sales growth (log-diff), scaled by the GDP per capita of the respective year. Loan number dummies are included; reference category is the 2<sup>nd</sup> loan. Loan use dummies are included; reference category is ‘working capital’. Economic sector dummies are included; reference category is ‘Trade’. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1) Sales growth Mozambique	(2) Sales growth Ghana	(3) Sales growth Congo
Initial sales	<b>-0.0215***</b> (0.000904)	<b>-0.00569***</b> (0.000326)	<b>-0.00940***</b> (0.00106)
Initial sales <sup>2</sup>	<b>0.00266***</b> (0.000239)	-0.0000506 (0.000139)	<b>0.000425***</b> (0.000136)
3 <sup>rd</sup> loan	<b>-0.00651***</b> (0.000432)	<b>-0.00450***</b> (0.000407)	<b>-0.00604***</b> (0.000549)
4 <sup>th</sup> loan	<b>-0.00884***</b> (0.000480)	<b>-0.00712***</b> (0.000499)	<b>-0.00864***</b> (0.000803)
5 <sup>th</sup> loan	<b>-0.0103***</b> (0.000556)	<b>-0.00938***</b> (0.000705)	<b>-0.0106***</b> (0.00109)
6 <sup>th</sup> loan	<b>-0.0115***</b> (0.000644)	<b>-0.0106***</b> (0.000845)	<b>-0.0174***</b> (0.00219)
7 <sup>th</sup> loan	<b>-0.0121***</b> (0.000812)	<b>-0.0116***</b> (0.00120)	<b>-0.0162***</b> (0.00363)
Maturity <sub>n-1</sub>	<b>-0.000673***</b> (0.0000901)	<b>-0.00113***</b> (0.000138)	<b>-0.000870***</b> (0.000190)
Interest rate <sub>n-1</sub>	<b>-0.0242***</b> (0.00723)	<b>-0.0386***</b> (0.00940)	0.00695 (0.00936)
Experience	-0.000000498 (0.000000561)	0.000000213 (0.00000117)	<b>0.0000141***</b> (0.00000199)
Fixed assets	<b>0.0103***</b> (0.00217)	<b>-0.00287***</b> (0.00108)	<b>-0.00345***</b> (0.00102)
Legal entity	0.00502 (0.00311)	<b>0.00282***</b> (0.000538)	<b>0.00264***</b> (0.000731)
Services	-0.000733 (0.000826)	<b>-0.00299***</b> (0.000441)	<b>-0.00760***</b> (0.00127)
Other sectors	0.000570 (0.000518)	<b>-0.00418***</b> (0.000659)	<b>-0.00542***</b> (0.00120)
Time without contract	<b>-0.000745***</b> (0.0000176)	<b>-0.000817***</b> (0.0000305)	<b>-0.000949***</b> (0.0000419)
No. of persons per household	0.0000141 (0.0000710)	0.000152 (0.000110)	<b>0.000191*</b> (0.000103)
Constant	<b>0.280**</b> (0.115)	<b>0.0349***</b> (0.00697)	<b>0.0650***</b> (0.0105)
Observations	44571	26335	16323
R <sup>2</sup>	0.2061	0.2871	0.1706

**Table 9: Borrower characteristics**

The dependent variable is monthly sales growth (log-diff), scaled by the GDP per capita of the respective year. Loan number dummies are included; reference category is the 2<sup>nd</sup> loan. Gender dummy is included; reference category is 'Male'. Civil status included; reference category is 'Single'. Loan use dummies are included; reference category is 'working capital'. Economic sector dummies are included; reference category is 'Trade'. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1) Sales growth_Mozambique	(2) Sales growth_Ghana	(3) Sales growth_Congo
Initial sales	<b>-0.0229***</b> (0.000945)	<b>-0.00548***</b> (0.000331)	<b>-0.0111***</b> (0.00153)
Initial sales <sup>2</sup>	<b>0.00295***</b> (0.000256)	-0.000253 (0.000173)	<b>0.000535**</b> (0.000215)
3 <sup>rd</sup> loan	<b>-0.00681***</b> (0.000434)	<b>-0.00419***</b> (0.000423)	<b>-0.00715***</b> (0.000575)
4 <sup>th</sup> loan	<b>-0.00934***</b> (0.000479)	<b>-0.00681***</b> (0.000497)	<b>-0.0112***</b> (0.000720)
5 <sup>th</sup> loan	<b>-0.0109***</b> (0.000552)	<b>-0.00843***</b> (0.000739)	<b>-0.0124***</b> (0.00109)
6 <sup>th</sup> loan	<b>-0.0122***</b> (0.000641)	<b>-0.0100***</b> (0.000824)	<b>-0.0212***</b> (0.00193)
7 <sup>th</sup> loan	<b>-0.0128***</b> (0.000809)	<b>-0.0101***</b> (0.00126)	<b>-0.0175***</b> (0.00443)
Experience	-0.000000402 (0.000000564)	-0.000000941 (0.00000132)	<b>0.0000164***</b> (0.00000229)
Fixed assets	<b>0.00967***</b> (0.00227)	<b>-0.00440***</b> (0.00136)	<b>-0.00263**</b> (0.00127)
Services	<b>-0.00173**</b> (0.000830)	<b>-0.00258***</b> (0.000473)	<b>-0.0117***</b> (0.00160)
Other sectors	0.000281 (0.000522)	<b>-0.00421***</b> (0.000794)	<b>-0.00955***</b> (0.00163)
Time without contract	<b>-0.000724***</b> (0.0000166)	<b>-0.000831***</b> (0.0000386)	<b>-0.00101***</b> (0.0000471)
No. of persons per household	-0.0000254 (0.0000718)	0.000158 (0.000119)	<b>0.000303***</b> (0.000109)
Female	<b>-0.00119***</b> (0.000337)	-0.0000841 (0.000396)	-0.000169 (0.000493)
Married	<b>0.00154***</b> (0.000485)	-0.000408 (0.000648)	<b>0.00171*</b> (0.000904)
Other family status	<b>0.00181***</b> (0.000682)	-0.000647 (0.000776)	<b>0.00209*</b> (0.00108)
Accompanied	0.000449 (0.000396)	0.00635 (0.00450)	<b>-0.00773*</b> (0.00445)
(Initial) age	<b>-0.0000762***</b> (0.0000186)	-0.0000188 (0.0000199)	<b>-0.000223***</b> (0.0000307)
Constant	<b>0.276**</b> (0.116)	<b>0.0282***</b> (0.00877)	<b>0.0783***</b> (0.0142)
Observations	44259	20356	12751
R <sup>2</sup>	0.2067	0.2925	0.1769

**Table 10: Baseline results – Loan size growth and Employment growth**

This table displays a robustness check with ‘Loan size growth’ and ‘Employment growth’ serving as dependent variables. OLS estimation results are presented. The dependent variables are monthly loan size growth (log-diff), scaled by GDP per capita of the respective year (column 1-3) and absolute monthly employment growth (column 4-6). Reference category for loan number is the second granted loan. Reference category regarding the fixed assets dummy is ‘working capital’ and regarding the economic sector is ‘Trade’. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Loan size growth_Mozam- bique	Loan size growth_Ghana	Loan size growth_Congo	Employment growth_Mozam- bique	Employment growth_Ghana	Employment growth_Congo
Initial loan size/employment	<b>-0.0148</b> *** (0.000421)	<b>-0.00852</b> *** (0.000274)	<b>-0.0100</b> *** (0.000658)	<b>0.000913</b> *** (0.000323)	<b>0.00107</b> *** (0.000239)	<b>0.00220</b> *** (0.000392)
Initial loan size <sup>2</sup> /employment <sup>2</sup>	<b>0.00127</b> ** (0.000376)	<b>0.00146</b> ** (0.000185)	<b>0.000392</b> ** (0.000162)	<b>-0.00000140</b> *** (0.00000488)	<b>-0.00000657</b> *** (0.00000174)	<b>-0.0000102</b> *** (0.00000241)
3 <sup>rd</sup> loan	<b>-0.0157</b> *** (0.000769)	<b>-0.0107</b> *** (0.000453)	<b>-0.0123</b> *** (0.000533)	<b>0.00310</b> *** (0.00109)	<b>0.00585</b> *** (0.00102)	-0.00251 (0.00175)
4 <sup>th</sup> loan	<b>-0.0222</b> *** (0.000845)	<b>-0.0169</b> *** (0.000553)	<b>-0.0210</b> *** (0.000715)	0.00113 (0.00114)	<b>0.00583</b> *** (0.00123)	<b>-0.00693</b> *** (0.00236)
5 <sup>th</sup> loan	<b>-0.0273</b> *** (0.000973)	<b>-0.0195</b> *** (0.000776)	<b>-0.0277</b> *** (0.00115)	0.00140 (0.00135)	<b>0.00512</b> *** (0.00177)	<b>-0.00920</b> *** (0.00332)
6 <sup>th</sup> loan	<b>-0.0300</b> *** (0.00120)	<b>-0.0225</b> *** (0.000988)	<b>-0.0322</b> *** (0.00222)	-0.000183 (0.00157)	-0.00116 (0.00226)	-0.0101 (0.00710)
7 <sup>th</sup> loan	<b>-0.0314</b> *** (0.00144)	<b>-0.0245</b> *** (0.00155)	<b>-0.0432</b> *** (0.00468)	-0.00209 (0.00184)	0.00281 (0.00343)	-0.0158 (0.0145)
Loan officer experience	<b>-0.00000511</b> *** (0.00000893)	<b>0.00000441</b> *** (0.00000139)	<b>0.0000150</b> *** (0.00000235)	-0.00000103 (0.00000126)	<b>-0.00000932</b> *** (0.00000315)	0.00000385 (0.00000754)
Fixed assets	<b>0.0167</b> *** (0.00296)	<b>0.00512</b> *** (0.00126)	<b>0.00296</b> *** (0.00112)	<b>0.0234</b> *** (0.00815)	-0.000849 (0.00305)	<b>0.0125</b> *** (0.00417)
Legal entity	-0.00635 (0.00658)	<b>0.00521</b> *** (0.000668)	<b>0.00301</b> *** (0.000795)	<b>-0.0167</b> * (0.00766)	<b>-0.00787</b> *** (0.00132)	0.00115 (0.00252)
Services	-0.000204 (0.00127)	<b>-0.00294</b> *** (0.000465)	<b>-0.00257</b> ** (0.00115)	-0.00279 (0.00247)	<b>-0.00295</b> *** (0.00108)	0.00264 (0.00451)
Other sectors	0.000917 (0.000788)	<b>-0.00177</b> ** (0.000814)	<b>-0.00214</b> * (0.00115)	<b>0.00242</b> * (0.00127)	0.00195 (0.00219)	0.00735 (0.00508)
Time without contract	<b>-0.00208</b> *** (0.0000409)	<b>-0.00194</b> *** (0.0000549)	<b>-0.00224</b> *** (0.0000650)	<b>-0.000294</b> *** (0.0000258)	<b>-0.000467</b> *** (0.0000671)	<b>-0.000813</b> *** (0.000148)
No. of persons per household	-0.0000777 (0.000109)	0.000106 (0.000125)	<b>0.000232</b> ** (0.000106)	0.0000690 (0.000181)	<b>-0.000583</b> ** (0.000235)	0.000404 (0.000361)
Constant	<b>0.293</b> *** (0.0649)	<b>0.0459</b> *** (0.00908)	<b>0.101</b> *** (0.0105)	<b>-0.00295</b> * (0.00159)	<b>-0.0183</b> * (0.0101)	<b>0.0913</b> ** (0.0364)
Observations	40652	26005	15959	43703	25826	16012
R <sup>2</sup>	0.1966	0.4090	0.3327	0.0138	0.0775	0.0264



**Table 11: Initial loan size classes – Loan size growth**

This table displays a robustness check with ‘Loan size growth’ serving as the dependent variable. OLS estimation results are presented. The dependent variables are monthly loan size growth (log-diff), scaled by GDP per capita of the respective year (column 1-3). Reference category for loan number is the second granted loan. Reference category regarding the fixed assets dummy is ‘working capital’ and regarding the economic sector is ‘Trade’. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level. Note that we refrain from running this test for employment growth because most clients initially have only one employee, making it difficult to split the sample in four classes according to differences in employment.

	(1)	(2)	(3)
	Loan size growth_ Mozambique	Loan size growth Ghana	Loan size growth Congo
Class 2: Initial loan size	<b>-0.00685</b> *** (0.000725)	<b>-0.00685</b> *** (0.000476)	<b>-0.00828</b> *** (0.000614)
Class 3: Initial loan size	<b>-0.0147</b> *** (0.000723)	<b>-0.0139</b> *** (0.000498)	<b>-0.0133</b> *** (0.000654)
Class 4: Initial loan size	<b>-0.0253</b> *** (0.000764)	<b>-0.0189</b> *** (0.000622)	<b>-0.0240</b> *** (0.000779)
3 <sup>rd</sup> loan	<b>-0.0156</b> *** (0.000770)	<b>-0.0106</b> *** (0.000452)	<b>-0.0122</b> *** (0.000536)
4 <sup>th</sup> loan	<b>-0.0219</b> *** (0.000846)	<b>-0.0166</b> *** (0.000552)	<b>-0.0207</b> *** (0.000718)
5 <sup>th</sup> loan	<b>-0.0268</b> *** (0.000973)	<b>-0.0189</b> *** (0.000772)	<b>-0.0272</b> *** (0.00116)
6 <sup>th</sup> loan	<b>-0.0292</b> *** (0.00120)	<b>-0.0216</b> *** (0.000978)	<b>-0.0316</b> *** (0.00222)
7 <sup>th</sup> loan	<b>-0.0303</b> *** (0.00144)	<b>-0.0230</b> *** (0.00155)	<b>-0.0417</b> *** (0.00475)
Loan officer experience	<b>-0.00000522</b> *** (0.000000893)	<b>0.00000271</b> * (0.00000139)	<b>0.0000118</b> *** (0.00000236)
Fixed assets	<b>0.0127</b> *** (0.00297)	<b>0.00472</b> *** (0.00128)	<b>0.00247</b> ** (0.00112)
Legal entity	<b>-0.0225</b> *** (0.00590)	<b>0.00370</b> *** (0.000629)	0.00122 (0.000803)
Services	-0.000461 (0.00128)	<b>-0.00279</b> *** (0.000468)	<b>-0.00252</b> ** (0.00116)
Other sectors	0.000237 (0.000787)	<b>-0.00178</b> ** (0.000823)	<b>-0.00269</b> ** (0.00116)
Time without contract	<b>-0.00205</b> *** (0.0000407)	<b>-0.00192</b> *** (0.0000549)	<b>-0.00222</b> *** (0.0000650)
No. of persons per household	-0.0000968 (0.000110)	0.0000728 (0.000125)	0.000135 (0.000108)
Constant	<b>0.308</b> *** (0.0634)	<b>0.0597</b> *** (0.00918)	<b>0.0961</b> *** (0.0102)
Observations	40652	26005	15959
R <sup>2</sup>	0.1927	0.4057	0.3232

**Table 12: Endogenous variables – Loan size growth and Employment growth**

This table displays a robustness check with ‘Loan size growth’ and ‘Employment growth’ serving as dependent variables. OLS estimation results are presented. The dependent variables are monthly loan size growth (log-diff), scaled by GDP per capita of the respective year (column 1-3) and absolute monthly employment growth (column 4-6). Reference category for loan number is the second granted loan. Reference category regarding the fixed assets dummy is ‘working capital’ and regarding the economic sector is ‘Trade’. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1) Loan size growth_ Mozambique	(2) Loan size growth_Ghana	(3) Loan size growth_Congo	(4) Employment growth_ Mozambique	(5) Employment growth_Ghana	(6) Employment growth_Congo
Initial loan size/employment	<b>-0.00501</b> *** (0.000524)	<b>-0.00688</b> *** (0.000439)	<b>-0.00764</b> *** (0.000658)	<b>0.000940</b> *** (0.000327)	<b>0.00105</b> *** (0.000239)	<b>0.00214</b> *** (0.000399)
Initial loan size <sup>2</sup> /employment <sup>2</sup>	<b>0.00113</b> *** (0.000391)	<b>0.00149</b> *** (0.000186)	<b>0.000806</b> *** (0.000167)	<b>-0.00000144</b> *** (0.000000493)	<b>-0.00000637</b> *** (0.00000174)	<b>-0.00000999</b> *** (0.00000238)
3 <sup>rd</sup> loan	<b>-0.0107</b> *** (0.000753)	<b>-0.00812</b> *** (0.000531)	<b>-0.00558</b> *** (0.000594)	<b>0.00322</b> *** (0.00110)	<b>0.00545</b> *** (0.00105)	-0.00288 (0.00191)
4 <sup>th</sup> loan	<b>-0.0135</b> *** (0.000857)	<b>-0.0129</b> *** (0.000740)	<b>-0.00700</b> *** (0.000982)	0.00132 (0.00117)	<b>0.00528</b> *** (0.00128)	<b>-0.00881</b> *** (0.00310)
5 <sup>th</sup> loan	<b>-0.0160</b> *** (0.000991)	<b>-0.0149</b> *** (0.000968)	<b>-0.0103</b> *** (0.00139)	0.00164 (0.00138)	<b>0.00451</b> ** (0.00182)	<b>-0.0114</b> *** (0.00399)
6 <sup>th</sup> loan	<b>-0.0168</b> *** (0.00123)	<b>-0.0172</b> *** (0.00119)	<b>-0.0153</b> *** (0.00231)	0.0000862 (0.00160)	-0.00188 (0.00233)	-0.0118 (0.00752)
7 <sup>th</sup> loan	<b>-0.0173</b> *** (0.00145)	<b>-0.0182</b> *** (0.00169)	<b>-0.0297</b> *** (0.00481)	-0.00182 (0.00186)	0.00202 (0.00345)	-0.0228 (0.0139)
Maturity <sub>n-1</sub>	<b>-0.00658</b> *** (0.000179)	<b>-0.00455</b> *** (0.000217)	<b>-0.00487</b> *** (0.000249)	-0.000258 (0.000224)	<b>0.000870</b> *** (0.000348)	0.0000492 (0.000791)
Interest rate <sub>n-1</sub>	<b>0.0790</b> *** (0.0114)	-0.0200 (0.0152)	<b>0.0650</b> *** (0.0118)	-0.00611 (0.0172)	0.00910 (0.0161)	-0.0334 (0.0376)
Experience	<b>-0.00000652</b> *** (0.000000876)	0.00000186 (0.00000136)	<b>0.0000157</b> *** (0.00000227)	-0.00000106 (0.00000126)	<b>-0.00000894</b> *** (0.00000314)	0.00000268 (0.00000777)
Fixed assets	<b>0.0218</b> *** (0.00295)	<b>0.00801</b> *** (0.00122)	<b>0.00498</b> *** (0.00109)	<b>0.0236</b> *** (0.00817)	-0.00143 (0.00305)	<b>0.0123</b> *** (0.00420)
Legal entity	-0.00146 (0.00691)	<b>0.00547</b> *** (0.000651)	<b>0.00362</b> *** (0.000811)	<b>-0.0165</b> *** (0.00790)	<b>-0.00814</b> *** (0.00135)	0.000353 (0.00259)
Services	0.00140 (0.00131)	<b>-0.00163</b> *** (0.000461)	-0.000120 (0.00112)	-0.00271 (0.00247)	<b>-0.00318</b> *** (0.00108)	0.00277 (0.00449)
Other sectors	<b>0.00237</b> *** (0.000806)	-0.000227 (0.000816)	-0.000462 (0.00117)	<b>0.00247</b> * (0.00128)	0.00162 (0.00220)	0.00730 (0.00508)
Time without contract	<b>-0.00201</b> *** (0.0000394)	<b>-0.00204</b> *** (0.0000536)	<b>-0.00241</b> *** (0.0000639)	<b>-0.000301</b> *** (0.0000294)	<b>-0.000440</b> *** (0.0000697)	<b>-0.000796</b> *** (0.000151)
No. of persons per household	0.0000129 (0.000116)	0.000135 (0.000124)	<b>0.000247</b> ** (0.000107)	0.0000771 (0.000181)	<b>-0.000596</b> ** (0.000235)	0.000353 (0.000360)
Constant	<b>0.295</b> *** (0.0652)	<b>0.0744</b> *** (0.00931)	<b>0.104</b> *** (0.0113)	-0.000831 (0.00494)	<b>-0.0252</b> ** (0.0115)	<b>0.103</b> *** (0.0396)
Observations	40652	26005	15955	43703	25826	16010
R <sup>2</sup>	0.2428	0.4321	0.3686	0.0139	0.0778	0.0266

**Table 13: Borrower characteristics – Loan size growth and Employment growth**

This table displays a robustness check with ‘Loan size growth’ and ‘Employment growth’ serving as dependent variables. OLS estimation results are presented. The dependent variables are monthly loan size growth (log-diff), scaled by GDP per capita of the respective year (column 1-3) and absolute monthly employment growth (column 4-6). Reference category for loan number is the second granted loan. Reference category regarding the fixed assets dummy is ‘working capital’ and regarding the economic sector is ‘Trade’. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1) Loan size growth_ Mozambique	(2) Loan size growth_Ghana	(3) Loan size growth_Congo	(4) Employment growth_ Mozambique	(5) Employment growth_Ghana	(6) Employment growth_Congo
Initial loan size/employment	<b>-0.0150</b> *** (0.000425)	<b>-0.00836</b> *** (0.000466)	<b>-0.0106</b> *** (0.000762)	<b>0.000965</b> ** (0.000378)	<b>0.00267</b> *** (0.000586)	<b>0.00560</b> *** (0.000728)
Initial loan size <sup>2</sup> /employment <sup>2</sup>	<b>0.00148</b> *** (0.000376)	<b>0.00218</b> *** (0.000354)	<b>0.000416</b> ** (0.000205)	<b>-0.00000147</b> *** (0.000000569)	<b>-0.0000336</b> *** (0.00000713)	<b>-0.0000581</b> *** (0.0000105)
3 <sup>rd</sup> loan	<b>-0.0159</b> *** (0.000770)	<b>-0.0110</b> *** (0.000487)	<b>-0.0124</b> *** (0.000589)	<b>0.00298</b> *** (0.00109)	<b>0.00339</b> *** (0.000972)	-0.000499 (0.00178)
4 <sup>th</sup> loan	<b>-0.0223</b> *** (0.000845)	<b>-0.0173</b> *** (0.000603)	<b>-0.0208</b> *** (0.000779)	0.00108 (0.00114)	<b>0.00302</b> *** (0.00114)	<b>-0.00422</b> * (0.00238)
5 <sup>th</sup> loan	<b>-0.0274</b> *** (0.000975)	<b>-0.0201</b> *** (0.000885)	<b>-0.0275</b> *** (0.00123)	0.00140 (0.00135)	0.00174 (0.00171)	<b>-0.00606</b> * (0.00339)
6 <sup>th</sup> loan	<b>-0.0302</b> *** (0.00120)	<b>-0.0236</b> *** (0.00106)	<b>-0.0355</b> *** (0.00214)	-0.000400 (0.00157)	-0.00207 (0.00247)	-0.00780 (0.00636)
7 <sup>th</sup> loan	<b>-0.0314</b> *** (0.00145)	<b>-0.0257</b> *** (0.00186)	<b>-0.0419</b> *** (0.00481)	-0.00221 (0.00184)	0.00270 (0.00383)	-0.00207 (0.0155)
Experience	<b>-0.00000521</b> *** (0.000000892)	<b>0.00000201</b> (0.00000152)	<b>0.0000186</b> *** (0.00000262)	-0.000000658 (0.00000125)	<b>-0.00000946</b> *** (0.00000297)	-0.00000667 (0.00000783)
Fixed assets	<b>0.0154</b> *** (0.00298)	<b>0.00512</b> *** (0.00151)	<b>0.00461</b> *** (0.00131)	<b>0.0246</b> *** (0.00832)	0.0000216 (0.00345)	0.00723 (0.00490)
Services	-0.000848 (0.00124)	<b>-0.00229</b> *** (0.000501)	-0.00202 (0.00130)	-0.00244 (0.00250)	<b>-0.00231</b> ** (0.00107)	0.00346 (0.00491)
Other sectors	0.000829 (0.000802)	-0.00108 (0.000981)	<b>-0.00431</b> *** (0.00142)	<b>0.00240</b> * (0.00128)	0.00269 (0.00256)	0.00569 (0.00606)
Time without contract	<b>-0.00207</b> *** (0.0000410)	<b>-0.00197</b> *** (0.0000662)	<b>-0.00237</b> *** (0.0000765)	<b>-0.000295</b> *** (0.0000251)	<b>-0.000379</b> *** (0.0000646)	<b>-0.000671</b> *** (0.000148)
No. of persons per household	-0.0000793 (0.000111)	<b>0.000344</b> *** (0.000135)	<b>0.000352</b> *** (0.000115)	0.0000923 (0.000185)	<b>-0.000548</b> ** (0.000261)	0.000309 (0.000395)
Female	-0.000817 (0.000544)	<b>-0.00100</b> ** (0.000476)	-0.000196 (0.000526)	0.000520 (0.000731)	0.0000355 (0.000909)	-0.000329 (0.00148)
Married	0.00108 (0.000766)	<b>0.00164</b> ** (0.000718)	0.00135 (0.000903)	0.000224 (0.001000)	-0.000279 (0.00129)	-0.000367 (0.00283)
Other family status	0.000858 (0.00111)	0.000950 (0.000869)	0.00139 (0.00112)	-0.000109 (0.00138)	0.000947 (0.00166)	-0.00281 (0.00319)
Accompanied	0.000208 (0.000632)	0.00528 (0.00400)	<b>-0.0175</b> *** (0.00613)	-0.000104 (0.000753)	-0.000130 (0.00656)	0.00105 (0.00660)
(Initial) age	<b>-0.0000983</b> *** (0.0000291)	<b>-0.000213</b> *** (0.0000272)	<b>-0.000191</b> *** (0.0000328)	-0.0000160 (0.0000381)	-0.0000153 (0.0000509)	<b>-0.000236</b> *** (0.0000910)
Constant	<b>0.296</b> *** (0.0652)	<b>0.0603</b> *** (0.0116)	<b>0.113</b> *** (0.0123)	-0.00295 (0.00220)	-0.0102 (0.00825)	<b>0.123</b> *** (0.0455)
Observations	40406	20157	12551	43439	20141	12618
R <sup>2</sup>	0.1977	0.4300	0.3409	0.0139	0.0716	0.0359

**Table 14: Interactions between number of loans and initial sales– Loan size growth and Employment growth**

This table displays a robustness check with ‘Loan size growth’ and ‘Employment growth’ serving as dependent variables. OLS estimation results are presented. The dependent variables are monthly loan size growth (log-diff), scaled by GDP per capita of the respective year (column 1-3) and absolute monthly employment growth (column 4-6). Reference category for loan number is the second granted loan. Reference category regarding the fixed assets dummy is ‘working capital’ and regarding the economic sector is ‘Trade’. Robust standard errors are shown in brackets and account for clustering at the client level. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1) Loan size growth_ Mozambique	(2) Loan size growth_Ghana	(3) Loan size growth_Congo	(4) Employment growth_ Mozambique	(5) Employment growth_Ghana	(6) Employment growth_Congo
Initial loan size/employment	<b>-0.0240</b> <sup>***</sup> (0.000680)	<b>-0.0105</b> <sup>***</sup> (0.000337)	<b>-0.00975</b> <sup>***</sup> (0.000724)	<b>0.00299</b> <sup>***</sup> (0.000713)	<b>0.00162</b> <sup>***</sup> (0.000342)	<b>0.00422</b> <sup>***</sup> (0.000617)
Initial loan size <sup>2</sup> /employment <sup>2</sup>	<b>0.00285</b> <sup>***</sup> (0.000376)	<b>0.00193</b> <sup>***</sup> (0.000194)	<b>0.000374</b> <sup>**</sup> (0.000164)	<b>-0.00000351</b> <sup>***</sup> (0.000000922)	<b>-0.00000484</b> <sup>***</sup> (0.00000172)	<b>-0.0000148</b> <sup>***</sup> (0.00000232)
3 <sup>rd</sup> loan	<b>-0.0161</b> <sup>***</sup> (0.000768)	<b>-0.0101</b> <sup>***</sup> (0.000502)	<b>-0.0120</b> <sup>***</sup> (0.000930)	<b>0.00518</b> <sup>**</sup> (0.00212)	<b>0.00917</b> <sup>**</sup> (0.00141)	<b>0.0118</b> <sup>**</sup> (0.00233)
4 <sup>th</sup> loan	<b>-0.0217</b> <sup>***</sup> (0.000853)	<b>-0.0154</b> <sup>***</sup> (0.000642)	<b>-0.0191</b> <sup>***</sup> (0.00123)	<b>0.00572</b> <sup>***</sup> (0.00147)	<b>0.00832</b> <sup>***</sup> (0.00137)	<b>-0.00254</b> (0.00308)
5 <sup>th</sup> loan	<b>-0.0262</b> <sup>***</sup> (0.00102)	<b>-0.0167</b> <sup>***</sup> (0.000990)	<b>-0.0263</b> <sup>***</sup> (0.00203)	<b>0.0132</b> <sup>***</sup> (0.00243)	<b>0.00823</b> <sup>***</sup> (0.00184)	<b>0.00425</b> (0.00513)
6 <sup>th</sup> loan	<b>-0.0273</b> <sup>***</sup> (0.00137)	<b>-0.0173</b> <sup>***</sup> (0.00154)	<b>-0.0353</b> <sup>***</sup> (0.00454)	<b>0.00846</b> <sup>***</sup> (0.00254)	<b>0.0102</b> <sup>**</sup> (0.00476)	<b>-0.00455</b> (0.0134)
7 <sup>th</sup> loan	<b>-0.0284</b> <sup>***</sup> (0.00180)	<b>-0.0199</b> <sup>***</sup> (0.00226)	<b>-0.0428</b> <sup>***</sup> (0.00685)	<b>0.00211</b> (0.00196)	<b>0.00759</b> <sup>*</sup> (0.00458)	<b>0.00559</b> (0.0254)
3 <sup>rd</sup> loan*Initial loan size/employment	<b>0.0106</b> <sup>***</sup> (0.00103)	<b>0.00290</b> <sup>***</sup> (0.000575)	<b>-0.000201</b> (0.000486)	<b>-0.00133</b> (0.00119)	<b>-0.00186</b> <sup>***</sup> (0.000627)	<b>-0.00477</b> <sup>***</sup> (0.000733)
4 <sup>th</sup> loan* Initial loan size/employment	<b>0.0163</b> <sup>***</sup> (0.00122)	<b>0.00495</b> <sup>***</sup> (0.000665)	<b>-0.00110</b> <sup>*</sup> (0.000664)	<b>-0.00290</b> <sup>***</sup> (0.000770)	<b>-0.00138</b> <sup>***</sup> (0.000460)	<b>-0.00161</b> <sup>**</sup> (0.000811)
5 <sup>th</sup> loan* Initial loan size/employment	<b>0.0166</b> <sup>***</sup> (0.00149)	<b>0.00637</b> <sup>***</sup> (0.000976)	<b>-0.000809</b> (0.00105)	<b>-0.00758</b> <sup>***</sup> (0.00169)	<b>-0.00177</b> <sup>***</sup> (0.000655)	<b>-0.00461</b> <sup>**</sup> (0.00183)
6 <sup>th</sup> loan* Initial loan size/employment	<b>0.0209</b> <sup>***</sup> (0.00188)	<b>0.00858</b> <sup>***</sup> (0.00136)	<b>0.00162</b> (0.00287)	<b>-0.00555</b> <sup>***</sup> (0.00167)	<b>-0.00683</b> <sup>**</sup> (0.00324)	<b>-0.00204</b> (0.00498)
7 <sup>th</sup> loan* Initial loan size/employment	<b>0.0194</b> <sup>***</sup> (0.00252)	<b>0.00694</b> <sup>***</sup> (0.00180)	<b>-0.000264</b> (0.00332)	<b>-0.00275</b> <sup>**</sup> (0.00115)	<b>-0.00289</b> <sup>*</sup> (0.00171)	<b>-0.00896</b> (0.00794)
Loan officer experience	<b>-0.00000450</b> <sup>***</sup> (0.000000882)	<b>0.00000354</b> <sup>**</sup> (0.00000139)	<b>0.0000149</b> <sup>***</sup> (0.00000235)	<b>-0.00000109</b> (0.00000126)	<b>-0.00000934</b> <sup>***</sup> (0.00000315)	<b>0.00000275</b> (0.00000752)
Fixed assets	<b>0.0159</b> <sup>***</sup> (0.00295)	<b>0.00525</b> <sup>***</sup> (0.00126)	<b>0.00293</b> <sup>***</sup> (0.00112)	<b>0.0207</b> <sup>**</sup> (0.00817)	<b>-0.000667</b> (0.00305)	<b>0.0132</b> <sup>***</sup> (0.00416)
Legal entity	<b>-0.0102</b> (0.00658)	<b>0.00498</b> <sup>***</sup> (0.000662)	<b>0.00306</b> <sup>***</sup> (0.000796)	<b>-0.0226</b> <sup>***</sup> (0.00787)	<b>-0.00764</b> <sup>***</sup> (0.00131)	<b>0.000850</b> (0.00253)
Services	<b>0.000354</b> (0.00127)	<b>-0.00282</b> <sup>***</sup> (0.000464)	<b>-0.00257</b> <sup>**</sup> (0.00115)	<b>-0.00330</b> (0.00246)	<b>-0.00298</b> <sup>***</sup> (0.00108)	<b>0.00136</b> (0.00449)
Other sectors	<b>0.00124</b> (0.000782)	<b>-0.00174</b> <sup>**</sup> (0.000814)	<b>-0.00216</b> <sup>*</sup> (0.00115)	<b>0.00223</b> <sup>*</sup> (0.00127)	<b>0.00251</b> (0.00220)	<b>0.00565</b> (0.00512)
Time without contract	<b>-0.00207</b> <sup>***</sup> (0.0000404)	<b>-0.00194</b> <sup>***</sup> (0.0000545)	<b>-0.00224</b> <sup>***</sup> (0.0000648)	<b>-0.000298</b> <sup>***</sup> (0.0000255)	<b>-0.000472</b> <sup>***</sup> (0.0000670)	<b>-0.000860</b> <sup>***</sup> (0.000149)
No. of persons per household	<b>-0.0000524</b> (0.000108)	<b>0.000124</b> (0.000124)	<b>0.000231</b> <sup>**</sup> (0.000106)	<b>0.0000423</b> (0.000181)	<b>-0.000593</b> <sup>**</sup> (0.000234)	<b>0.000364</b> (0.000360)
Constant	<b>0.288</b> <sup>***</sup> (0.0658)	<b>0.0462</b> <sup>***</sup> (0.00905)	<b>0.101</b> <sup>***</sup> (0.0105)	<b>-0.00546</b> <sup>***</sup> (0.00202)	<b>-0.0202</b> <sup>**</sup> (0.0101)	<b>0.0835</b> <sup>***</sup> (0.0365)
Observations	40652	26005	15959	43703	25826	16012
R <sup>2</sup>	0.2047	0.4120	0.3329	0.0178	0.0813	0.0390

**Table 15: Quantile regression – Mozambique**

The dependent variable is monthly sales growth (log-diff), scaled by the GDP per capita of the respective year. Reference category is the second granted loan. Reference category regarding the fixed assets dummy is ‘working capital’ and regarding the economic sector is ‘Trade’. Bootstrapped standard errors are shown in brackets. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Q <sub>.01</sub>	Q <sub>.1</sub>	Q <sub>.25</sub>	Q <sub>.5</sub>	Q <sub>.75</sub>	Q <sub>.9</sub>	Q <sub>.99</sub>
Sales growth							
Initial sales	<b>-0.0108*</b> (0.00632)	<b>-0.0159***</b> (0.00136)	<b>-0.0137***</b> (0.000777)	<b>-0.0163***</b> (0.000710)	<b>-0.0231***</b> (0.000900)	<b>-0.0316***</b> (0.00197)	<b>-0.0448***</b> (0.00666)
Initial sales <sup>2</sup>	<b>-0.00560***</b> (0.00201)	0.000380 (0.000449)	<b>0.00142***</b> (0.000217)	<b>0.00223***</b> (0.000178)	<b>0.00389***</b> (0.000215)	<b>0.00568***</b> (0.000526)	<b>0.00936***</b> (0.00180)
3 <sup>rd</sup> loan	<b>-0.0128***</b> (0.00293)	<b>-0.00539***</b> (0.000468)	<b>-0.00364***</b> (0.000251)	<b>-0.00469***</b> (0.000274)	<b>-0.00688***</b> (0.000485)	<b>-0.00874***</b> (0.000887)	<b>-0.0210***</b> (0.00373)
4 <sup>th</sup> loan	<b>-0.0180***</b> (0.00426)	<b>-0.00908***</b> (0.000785)	<b>-0.00570***</b> (0.000330)	<b>-0.00654***</b> (0.000342)	<b>-0.00886***</b> (0.000472)	<b>-0.0121***</b> (0.00108)	<b>-0.0255***</b> (0.00457)
5 <sup>th</sup> loan	<b>-0.0219***</b> (0.00346)	<b>-0.0117***</b> (0.000940)	<b>-0.00703***</b> (0.000387)	<b>-0.00783***</b> (0.000326)	<b>-0.0103***</b> (0.000554)	<b>-0.0132***</b> (0.00106)	<b>-0.0261***</b> (0.00516)
6 <sup>th</sup> loan	<b>-0.0249***</b> (0.00514)	<b>-0.0135***</b> (0.00116)	<b>-0.00810***</b> (0.000520)	<b>-0.00848***</b> (0.000485)	<b>-0.0105***</b> (0.000752)	<b>-0.0150***</b> (0.00127)	<b>-0.0270***</b> (0.00532)
7 <sup>th</sup> loan	<b>-0.0255***</b> (0.00479)	<b>-0.0143***</b> (0.00148)	<b>-0.00876***</b> (0.000666)	<b>-0.00897***</b> (0.000547)	<b>-0.0111***</b> (0.000814)	<b>-0.0150***</b> (0.00153)	<b>-0.0193**</b> (0.00798)
Loan officer experience	-0.000000891 (0.00000365)	<b>-0.00000314***</b> (0.000000926)	<b>-0.000000877**</b> (0.000000436)	<b>-0.000000847**</b> (0.000000345)	0.000000127 (0.000000577)	0.000000114 (0.00000117)	<b>0.00000819**</b> (0.00000396)
Fixed assets	-0.00414 (0.0166)	0.00330 (0.00350)	0.00274 (0.00173)	<b>0.00368**</b> (0.00165)	<b>0.0134***</b> (0.00294)	<b>0.0237***</b> (0.00446)	<b>0.0235*</b> (0.0140)
Legal entity	<b>0.0574***</b> (0.0116)	<b>0.0203***</b> (0.00541)	<b>0.00458*</b> (0.00273)	0.00402 (0.00278)	-0.00197 (0.00275)	-0.000447 (0.00661)	-0.0358 (0.0456)
Services	<b>-0.0254***</b> (0.00896)	<b>-0.00275**</b> (0.00109)	<b>-0.00127**</b> (0.000606)	-0.000237 (0.000746)	0.000703 (0.00108)	<b>0.00256*</b> (0.00141)	0.0130 (0.00891)
Other sectors	<b>-0.0159***</b> (0.00445)	<b>-0.00453***</b> (0.000797)	<b>-0.000899**</b> (0.000359)	<b>0.000684*</b> (0.000372)	<b>0.00240***</b> (0.000510)	<b>0.00590***</b> (0.00100)	<b>0.0112***</b> (0.00407)
Time without contract	<b>0.000224***</b> (0.0000604)	<b>-0.000316***</b> (0.0000304)	<b>-0.000395***</b> (0.0000175)	<b>-0.000485***</b> (0.0000150)	<b>-0.000665***</b> (0.0000160)	<b>-0.000929***</b> (0.0000237)	<b>-0.00135***</b> (0.0000587)
No. of persons per household	0.000903 (0.000597)	0.000154 (0.000119)	0.0000635 (0.0000615)	0.0000763 (0.0000533)	-0.0000321 (0.0000958)	0.0000462 (0.000132)	-0.000832 (0.000520)
Constant	0.106 (0.128)	0.118 (0.121)	0.115 (0.136)	0.130 (0.191)	<b>0.554***</b> (0.212)	<b>0.561***</b> (0.198)	<b>0.575***</b> (0.192)
Observations	44568	44568	44568	44568	44568	44568	44568
R <sup>2</sup>	0.1631	0.1332	0.1443	0.1527	0.1593	0.1672	0.2070

**Table 16: Quantile regression – Ghana**

The dependent variable is monthly sales growth (log-diff), scaled by the GDP per capita of the respective year. Reference category is the second granted loan. Reference category regarding the fixed assets dummy is 'working capital' and regarding the economic sector is 'Trade'. Bootstrapped standard errors are shown in brackets. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Q <sub>.01</sub>	Q <sub>.1</sub>	Q <sub>.25</sub>	Q <sub>.5</sub>	Q <sub>.75</sub>	Q <sub>.9</sub>	Q <sub>.99</sub>
Sales growth							
Initial sales	-0.000182 (0.00279)	<b>-0.00233***</b> (0.000460)	<b>-0.00320***</b> (0.000236)	<b>-0.00445***</b> (0.000225)	<b>-0.00732***</b> (0.000370)	<b>-0.0104***</b> (0.000714)	<b>-0.0162***</b> (0.00201)
Initial sales <sup>2</sup>	<b>-0.00290**</b> (0.00126)	<b>-0.000839***</b> (0.000208)	<b>-0.000360***</b> (0.000104)	-0.0000741 (0.0000960)	<b>0.000779***</b> (0.000151)	<b>0.00154***</b> (0.000261)	<b>0.00269***</b> (0.000806)
3 <sup>rd</sup> loan	<b>-0.00444*</b> (0.00257)	<b>-0.00266***</b> (0.000524)	<b>-0.00251***</b> (0.000276)	<b>-0.00343***</b> (0.000250)	<b>-0.00486***</b> (0.000337)	<b>-0.00668***</b> (0.000583)	<b>-0.00677**</b> (0.00279)
4 <sup>th</sup> loan	<b>-0.00706*</b> (0.00394)	<b>-0.00450***</b> (0.000656)	<b>-0.00493***</b> (0.000372)	<b>-0.00595***</b> (0.000315)	<b>-0.00755***</b> (0.000423)	<b>-0.00848***</b> (0.000712)	<b>-0.0113***</b> (0.00245)
5 <sup>th</sup> loan	<b>-0.0117**</b> (0.00456)	<b>-0.00639***</b> (0.000900)	<b>-0.00600***</b> (0.000486)	<b>-0.00726***</b> (0.000460)	<b>-0.00968***</b> (0.000629)	<b>-0.0124***</b> (0.00109)	<b>-0.00848*</b> (0.00492)
6 <sup>th</sup> loan	<b>-0.0179*</b> (0.00994)	<b>-0.00661***</b> (0.00110)	<b>-0.00714***</b> (0.000779)	<b>-0.00832***</b> (0.000692)	<b>-0.0106***</b> (0.000748)	<b>-0.0124***</b> (0.00128)	<b>-0.0223***</b> (0.00419)
7 <sup>th</sup> loan	-0.0288 (0.0179)	<b>-0.00693***</b> (0.00138)	<b>-0.00697***</b> (0.000779)	<b>-0.00860***</b> (0.00110)	<b>-0.0122***</b> (0.000887)	<b>-0.0167***</b> (0.00206)	<b>-0.0220***</b> (0.00531)
Loan officer experience	0.00000973 (0.00000774)	<b>0.00000261*</b> (0.00000152)	0.00000125 (0.000000836)	0.000000800 (0.000000929)	0.000000259 (0.00000111)	-0.00000201 (0.00000158)	-0.00000285 (0.00000647)
Fixed assets	<b>-0.0291***</b> (0.0107)	<b>-0.00500**</b> (0.00195)	<b>-0.00371***</b> (0.000878)	<b>-0.00214***</b> (0.000803)	-0.000860 (0.00116)	0.000465 (0.00195)	-0.00300 (0.00536)
Legal entity	-0.00208 (0.00355)	-0.000820 (0.000878)	0.0000440 (0.000446)	<b>0.00186***</b> (0.000429)	<b>0.00325***</b> (0.000515)	<b>0.00670***</b> (0.000812)	<b>0.0136***</b> (0.00298)
Services	<b>-0.0178***</b> (0.00459)	<b>-0.00357***</b> (0.000617)	<b>-0.00208***</b> (0.000338)	<b>-0.00234***</b> (0.000292)	<b>-0.00165***</b> (0.000440)	-0.00125 (0.000790)	-0.00135 (0.00254)
Other sectors	<b>-0.0216***</b> (0.00594)	<b>-0.00651***</b> (0.00115)	<b>-0.00434***</b> (0.000614)	<b>-0.00401***</b> (0.000578)	<b>-0.00237***</b> (0.000691)	<b>-0.00340***</b> (0.00119)	0.00234 (0.00481)
Time without contract	0.000101 (0.0000797)	<b>-0.000580***</b> (0.0000472)	<b>-0.000603***</b> (0.0000341)	<b>-0.000663***</b> (0.0000298)	<b>-0.000736***</b> (0.0000284)	<b>-0.000840***</b> (0.0000419)	<b>-0.00116***</b> (0.0000784)
No. of persons per household	0.000706 (0.000796)	<b>0.000294*</b> (0.000174)	0.0000888 (0.000104)	0.0000524 (0.000105)	0.0000633 (0.000107)	-0.0000630 (0.000157)	<b>-0.000705*</b> (0.000415)
Constant	<b>-0.0459***</b> (0.00705)	<b>-0.0265***</b> (0.00976)	-0.00830 (0.00564)	<b>0.0363***</b> (0.0100)	<b>0.0363***</b> (0.0100)	<b>0.0975***</b> (0.0228)	<b>0.130***</b> (0.00607)
Observations	26335	26335	26335	26335	26335	26335	26335
R <sup>2</sup>	0.1536	0.2683	0.2382	0.2028	0.1994	0.2047	0.2586

**Table 17: Quantile regression – Congo**

The dependent variable is monthly sales growth (log-diff), scaled by the GDP per capita of the respective year. Reference category is the second granted loan. Reference category regarding the fixed assets dummy is ‘working capital’ and regarding the economic sector is ‘Trade’. Bootstrapped standard errors are shown in brackets. Monthly fixed effects and branch fixed effects are included but not reported. \*, \*\*, and \*\*\* denote significance at the 0.10, 0.05 and 0.01 level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Q <sub>01</sub>	Q <sub>1</sub>	Q <sub>25</sub>	Q <sub>5</sub>	Q <sub>75</sub>	Q <sub>9</sub>	Q <sub>99</sub>
Sales growth							
Initial sales	-0.00355 (0.0106)	<b>-0.00284*</b> (0.00158)	<b>-0.00407***</b> (0.000908)	<b>-0.00813***</b> (0.000788)	<b>-0.0108***</b> (0.00115)	<b>-0.0176***</b> (0.00308)	<b>-0.0288***</b> (0.00677)
Initial sales <sup>2</sup>	-0.00179 (0.00146)	<b>-0.000488**</b> (0.000228)	-0.0000926 (0.000125)	<b>0.000450***</b> (0.000100)	<b>0.000582***</b> (0.000151)	<b>0.00134***</b> (0.000403)	<b>0.00249***</b> (0.000879)
3 <sup>rd</sup> loan	<b>-0.0159***</b> (0.00435)	<b>-0.00438***</b> (0.000746)	<b>-0.00393***</b> (0.000414)	<b>-0.00526***</b> (0.000453)	<b>-0.00776***</b> (0.000625)	<b>-0.0114***</b> (0.00110)	<b>-0.0132***</b> (0.00325)
4 <sup>th</sup> loan	<b>-0.0177***</b> (0.00501)	<b>-0.00760***</b> (0.00104)	<b>-0.00691***</b> (0.000537)	<b>-0.00872***</b> (0.000540)	<b>-0.0118***</b> (0.000734)	<b>-0.0146***</b> (0.00142)	<b>-0.0236***</b> (0.00430)
5 <sup>th</sup> loan	<b>-0.0303***</b> (0.00870)	<b>-0.0121***</b> (0.00209)	<b>-0.00818***</b> (0.000885)	<b>-0.0106***</b> (0.000791)	<b>-0.0145***</b> (0.00101)	<b>-0.0146***</b> (0.00233)	<b>-0.0279***</b> (0.00553)
6 <sup>th</sup> loan	<b>-0.0293</b> (0.0280)	<b>-0.0202***</b> (0.00394)	<b>-0.0130***</b> (0.00150)	<b>-0.0157***</b> (0.000980)	<b>-0.0208***</b> (0.00159)	<b>-0.0235***</b> (0.00496)	<b>-0.0195*</b> (0.0103)
7 <sup>th</sup> loan	<b>-0.0384**</b> (0.0185)	<b>-0.0143*</b> (0.00776)	<b>-0.0105***</b> (0.00334)	<b>-0.0146***</b> (0.00226)	<b>-0.0234***</b> (0.00321)	<b>-0.0229*</b> (0.0132)	<b>-0.0259*</b> (0.0149)
Loan officer experience	<b>0.0000779***</b> (0.0000181)	<b>0.0000187***</b> (0.00000309)	<b>0.0000122***</b> (0.00000169)	<b>0.00000876***</b> (0.00000150)	<b>0.00000582**</b> (0.00000229)	-0.000000190 (0.00000413)	0.000000822 (0.0000155)
Fixed assets	<b>-0.0191***</b> (0.00736)	<b>-0.00572***</b> (0.00220)	<b>-0.00308***</b> (0.000900)	<b>-0.00282***</b> (0.000742)	<b>-0.00234**</b> (0.00118)	<b>-0.00351*</b> (0.00193)	-0.00395 (0.00518)
Legal entity	0.00582 (0.00467)	0.000201 (0.000976)	0.000278 (0.000530)	<b>0.00124**</b> (0.000599)	<b>0.00184**</b> (0.000923)	0.00266 (0.00163)	0.00381 (0.00432)
Services	<b>-0.0261***</b> (0.00812)	<b>-0.00976***</b> (0.00207)	<b>-0.00696***</b> (0.00120)	<b>-0.00552***</b> (0.000912)	<b>-0.00564***</b> (0.00136)	<b>-0.00647**</b> (0.00284)	0.00267 (0.00474)
Other sectors	<b>-0.0287***</b> (0.00879)	<b>-0.0125***</b> (0.00275)	<b>-0.00589***</b> (0.00101)	<b>-0.00522***</b> (0.00106)	-0.00188 (0.00173)	0.000179 (0.00233)	0.00383 (0.00574)
Time without contract	0.000122 (0.000286)	<b>-0.000742***</b> (0.0000588)	<b>-0.000683***</b> (0.0000384)	<b>-0.000666***</b> (0.0000403)	<b>-0.000844***</b> (0.0000402)	<b>-0.00118***</b> (0.0000656)	<b>-0.00177***</b> (0.000138)
No. of persons per household	0.000898 (0.000633)	<b>0.000241*</b> (0.000133)	0.000112 (0.0000728)	0.000116 (0.0000792)	0.00000943 (0.000149)	0.0000219 (0.000235)	0.000405 (0.000636)
Constant	0.0264 (0.0187)	0.0108 (0.00873)	<b>0.0275***</b> (0.00765)	<b>0.0392***</b> (0.0137)	<b>0.0826***</b> (0.0172)	<b>0.120***</b> (0.0310)	<b>0.211***</b> (0.0384)
Observations	16327	16327	16327	16327	16327	16327	16327
R <sup>2</sup>	0.1367	0.0927	0.1144	0.1217	0.1132	0.1159	0.1724

## Appendix 1: List of variables

### *Dependent variables*

<i>Sales growth</i>	The log difference of sales between two consecutive loans. We convert values from local currency into US Dollar (IFS) and divide it by the GDP per capita of the respective country in the given year (World Development Indicator). Finally, we divide this growth rate by the number of months between the two loans.
<i>Loan size growth</i>	The log difference of the loan size between two consecutive loans. We convert values from local currency into US Dollar (IFS) and divide it by the GDP per capita in the given year (World Development Indicator). Finally, we divide this growth rate by the number of months between the two loans.
<i>Employment growth</i>	The absolute difference of the number of employees in the micro business between two consecutive loans. We divide the amount by the number of months between the two loans.

### *Explanatory variables*

#### **Panel A: All approved loans**

<i>Initial sales</i>	Natural logarithm of firm size at the beginning of the bank-firm relationship, divided by GDP per capita growth of the respective country in the given year
<i>Initial sales<sup>2</sup></i>	Squared natural logarithm of firm size at the beginning of the bank-firm relationship, divided by GDP per capita growth of the respective country in the given year
<i>Class 1-4: Initial sales</i>	Four dummy variables, grouped into quartiles according to the initial client sales
<i>Loan number</i>	Number of repeat loan, the client has received
<i>Loan officer experience</i>	Number of loans the loan officer has handled at the moment of each approved loan
<i>Fixed assets</i>	Loan use Dummy variable
<i>Working capital</i>	Loan use Dummy variable
<i>Legal entity</i>	Type of business ownership Dummy variable
<i>Individual</i>	Type of business ownership Dummy variable
<i>Trade</i>	The business sector, the firm operates in Dummy variable
<i>Services</i>	The business sector, the firm operates in Dummy variable
<i>Other sectors</i>	The business sector, the firm operates in including agriculture, manufacturing and construction Dummy variable
<i>Time without contract</i>	Number of months between two consecutive loans (period without a loan contract)
<i>No. of persons per household</i>	Number of persons living in one household
<i>Maturity</i>	Maturity in months, time-lagged by one year
<i>Interest rate</i>	Interest rate in %, time-lagged by one year



**Panel B: Only sole proprietorship**

<i>Initial age</i>	Initial age of the borrower in year
<i>Female</i>	Gender of the borrower Dummy variable
<i>Male</i>	Gender of the borrower Dummy variable
<i>Single</i>	Civil status of the borrower Dummy variable
<i>Married</i>	Civil status of the borrower Dummy variable
<i>Other family status (divorced or widowed)</i>	Civil status of the borrower Dummy variable
<i>Accompanied</i>	Civil status of the borrower Dummy variable