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## The Determinants of Expansion of SMEs under a Partial Credit Guarantee Scheme: The Case of Lebanon

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## **Abstract**

The aim of this paper is to try and assess the impact of the Lebanese credit guarantee scheme (Kafalat) on its clients. The study relies on an exceptional dataset of 6,888 loan guarantee applications, which we are the first to have access to. The dataset, which Kafalat has made available to us, contains all applications for loan guarantees received by Kafalat since its establishment in 2000 until December 2009. The first set of regressions will paint a picture of the general distribution of loan sizes across regions and sectors. We then look at Kafalat's returning borrowers. This will tell us something about the role of Kafalat in stimulating significant expansion and growth in particular sectors or regions. Finally, we seek to determine a certain pattern in the evolution of loan sizes among regular borrowers.

## I- Introduction

Small and medium enterprises (SMEs) have come to be seen as major players in stimulating economic growth (OECD, 2004).

In Lebanon, it is difficult to assess the contribution of SMEs to the economy. There is a severe dearth of information and data concerning the subject. With SMEs dominating the Lebanese economy (Census of Buildings and Establishments, 1996), it is important to assess the overall environment and underline what is being done in order to enhance their productivity and encourage investments.

One of the major constraints faced by small and medium enterprises in the MENA region is the restricted access to credit, fuelled by the high levels of collaterals demanded by financial institutions. In response to those problems, a non profit partial credit guarantee scheme, Kafalat, was established in 2000 by fifty Lebanese banks and the National Institute for the Guarantee of Deposits. The aim of the guarantee scheme was to back loans taken by small and medium enterprises and facilitate access to credits.

In this paper, we try to analyze the impact of the Lebanese credit guarantee scheme on the different sectors and regions. Our analysis is based on an exceptional dataset comprising all loan guarantee applications (6,888 observations) received by Kafalat, since its establishment in the year 2000.

We start by looking at the general distribution of the Kafalat-backed loan sizes across the various sectors and regions. We then look at the returning clients of the credit guarantee scheme. We focus on the areas and sectors where small and medium enterprises are using Kafalat as a constant source of funding, and are interested in continuously expanding their activities over time. Returning clients will be taken as a proxy to observe expansion in the activities of small and medium enterprises. This will help us assess the impact of Kafalat on the areas and sector that it is operating in. Finally, we look at the expansion in loan sizes of the returning SME clients. We try to determine if, for certain areas, clients are not only borrowing multiple times under Kafalat, but are also experiencing significant growth and expansion of their activities over time.

The paper does not offer a complete view of the situation of small and medium enterprises and the Lebanese credit guarantee scheme, because of data restrictions and banking secrecy. However, it will help paint a clearer picture of the situation of small and medium enterprises in Lebanon, and the results can be used as a base for future analysis. The paper is organized as follows: Section II provides an overview of the past literature dealing with SMEs and credit guarantee schemes. Section III presents the general environment and financing of SMEs in Lebanon, as well as Kafalat's operations. Section IV focuses on the research methodology and section V is the conclusion.

## II- Literature review

Stiglitz underlines the importance of financial institutions for development in providing capital to small and medium businesses. "What is...crucial is the ability of a country to channel capital to where it is needed- and this requires appropriately

equipped...financial institutions. These financial institutions must be geared to provide capital for small businesses and micro-credit facilities.” (Stiglitz, 2005).

In recent years, SMEs have come to be seen as playing an important role in stimulating economic growth. SMEs increase productivity, decrease unemployment, provide jobs for low-skilled workers and reduce poverty (OECD, 2004). The Organization for Economic Co-operation and Development (OECD) recommends that policies should be aimed at increasing “the capacity of financial institutions to construct profitable SME lending programs, while prioritizing the development of innovative solutions to collateral issues”. Credit guarantee programs come about to correct inefficiencies in the markets for loanable funds. The presence of informational asymmetries in these markets will lead to “credit rationing”. Stiglitz and Weiss (1981) postulate that even in equilibrium, there is an excess demand for loanable funds, or what is called credit rationing, and interest rates don’t always allow for the selection of credit-worthy SME.

Vogel and Adams (1997) show that moral hazard and the costs of monitoring are also an issue when lending to small businesses. Hodgman suggests that by not giving out loans, “the lender is not denying himself (or being denied) an advantage (higher interest rates) which he normally seeks, but is behaving rationally in the face of risk” (Hodgman, 1960). According to Levitsky (1997), one of the main financial constraints to small and medium enterprises is that commercial banks are cautious when it comes to lending. In fact, financial institutions’ reluctance is mainly due to the risk of credit default and the lack of proper collateral when lending to SMEs. Furthermore, Beck and Demirgüç-Kunt (2006), show that SMEs not only have more restricted access to funds than large firms, but endure much more negative effects when they are unable to borrow.

For developing countries in particular, banks are usually more wary of lending to the private sector. A study conducted by USAID lists the main reasons for this reluctance. It states that in developing countries, the enforcement of contracts is usually “time-consuming and costly and the outcome is not always assured.” (USAID, 2004). There are usually inefficient mechanisms to try to recover the lender’s capital when there is default. Hence, the lender frequently requires high collaterals that small enterprises cannot usually provide.

Also, banks are usually more inclined to invest in government bonds, which yield higher interest rates in developing countries, than to provide funding for small enterprises. A high degree of informational asymmetries is listed as one of the main causes of low private lending. Financial statements and records are often viewed as inaccurate and unreliable, and banks cannot measure properly the ability of the borrower to repay the loan.

In this context, government-backed partial credit guarantee schemes have emerged in recent years to facilitate SMEs’ access to credit. The schemes decrease the lending risk for financial institutions, through providing a loan repayment guarantee in the case of default. The risk will also be diversified, as the credit guarantee scheme will guarantee loans for various regions and sectors (Honohan, 2010). A credit guarantee scheme is thus seen as a “risk transfer and risk diversification mechanism” (Beck, Klapper and Mendoza, 2010). Guarantee schemes also tend to facilitate access to the borrower’s information and offer SMEs a longer repayment period for their loans.

Guarantee schemes differ in their design across countries; the decision regarding the approval of the guaranteed loan can either be made solely by the lender, or in

collaboration with the guarantor. The level of the guarantee varies according to the guarantee program under which the borrower takes the loan. Guarantee schemes usually “set fees in an attempt to recover costs of honoring defaults or to preserve the integrity of the pool of capital”. Guarantors can also set certain eligibility criteria, like restricting the use of the guaranteed loans to certain activities. (Riding, Madill, Haines Jr., 2007) On the effectiveness of guarantee schemes, Freedman (2004) states that a partial credit guarantee scheme should be able to achieve certain goals in order to be able to improve economic growth. Credit guarantee schemes should aim at reducing market imperfections. They should allow credit-worthy enterprises to have access to funds. They should also achieve “additionality”, or allow for SMEs that wouldn’t have been able to borrow without the scheme, to have access to credit. Furthermore, the guarantee scheme should not offer room for moral hazard. Lenders should properly screen and monitor potential clients, and borrowers should be motivated to pay back the loans. Finally, guarantee schemes should play an efficient role in providing continuous lending. “If loan guarantees...spark sustained lending to new sectors or new borrowers they can serve as a catalyst for the development of local credit markets”. Banks will then be more willing to give out loans, after having experienced a long term continuous relationship with returning customers under the credit guarantee scheme.

There is still no consensus about the benefits of credit guarantee schemes and their effectiveness in allowing access to credit. Some argue that guarantee schemes are costly and cause problems of financial sustainability (Vogel and Adams, 1997). This can be caused by the high number of credit defaults, as well as elevated guarantee coverage ratios and fees. Others see that one of the main benefits of guarantee schemes is to allow for SMEs to take out loans that they wouldn’t have had access to otherwise (Riding, Madill, Haines Jr., 2007). Guarantee schemes also improve loan conditions as they allow for more flexible collateral demands for large loans, and longer credit repayment periods (Meyer and Nagarajan, 1996). However, there is still scarce evidence about the effectiveness of partial credit guarantee schemes on SMEs lending.

This paper will contribute to the existing literature, by providing evidence about the effectiveness of the Lebanese credit guarantee scheme and its impact on borrowers.

### III- Small and Medium Enterprises in Lebanon

#### 1) SME background

According to the 1996 Census of Buildings and Establishments, the vast majority of enterprises in Lebanon can be classified as SMEs. In 1996, 92.53% and 93.81% of enterprises for respectively the agriculture and services sectors had less than five employees. For the industrial sector, 91.48% of enterprises had less than nine employees. According to the Inception Report of the Ministry of Economy, the situation is still the same. The report also refers to a study conducted in 2003, that shows that as little as 1,365 of these SME have a turnover of more than 300,000 Euros, with the industrial sector exhibiting the best performance.

A study conducted by the Consultation and Research Institute in 2004 reveals a more detailed distribution of SMEs according to industry and regions.

The survey reports that 72.6% of SMEs list trade as their major activity. 8.8% of surveyed enterprises are in the industrial sector, while the tourism sector has a share of 5.1%. The report also shows that 81% of enterprises with only one worker rely on trade, while the number is reduced to 37% for enterprises with 10 to 49 employees. The industrial and tourism sectors hold the highest shares among bigger enterprises, with 28.4% of enterprises with 10-49 employees and 5.1% with one employee working in the industrial sector.

For regions, the report highlights that larger enterprises tend to be located in more developed areas while micro enterprises dominate poorer regions with more restricted access to finance, markets, services and infrastructure. SMEs with only one worker constitute 32.7% of enterprises in the Beirut mouhafaza, while the number increases to 47% for the Bekaa and 56.1% for North Lebanon. Table1 shows that the share of enterprises with 5 to 9 employees, and 10 to 49 employees is significantly higher for Beirut and Mount Lebanon than for other regions.

The report found that 93.5% of SMEs were owned by individuals, and that SMEs in the industrial and tourism sectors are more inclined to form partnerships.

The survey shows that access to initial capital for start-ups and high taxes are listed as the most major constraints for SMEs in Lebanon. Also, 24% of SMEs have restricted access to financial services and 42% complained about the shortage in credit. Only 8.3% of SMEs had a loan at the time of the survey. 69% of borrowers acquired their loans from banks, 18% from friends and relatives, and 6% from business colleagues.

Another survey conducted by the World Bank's Enterprise Surveys shows that the value of collateral demanded by financial institutions amount to 160.59% of the value of the loan. The figure is higher than that of the MENA region (150.91%), and other selected countries (see table 2).

## **2) The banking sector**

The banking sector in Lebanon has been characterized by a strong performance in the post-war era. It is known to be one of the most developed in the MENA region. In Lebanon, as well as in the other MENA countries, with the absence of a developed financial system, the most important source of funding is banks.

In 2008, domestic credit provided by banks as a percent of GDP reached 169% which is much higher than the 43% average for the entire MENA region, and other selected countries (WDI, 2008). However, for the domestic credit as percent of GDP indicator, Lebanon (with 74.36%) seems to be closer to the MENA region average of 52.64% and lower than Morocco (77.43%) and Jordan (83.76%) (WDI, 2008). (see Table 3,)

In 2007, bank loans reached 35,425,800.024 million LBP and 23,499.702 million dollars (BilanBanques, 2007). However, according to Mr. Nassib Ghobril (OECD, 2007), 75% of loans given to the private sector benefit only 3% of customers. This implies that banks are still cautious about funding small businesses.

Nevertheless, some banks have been making efforts towards improving the situation, especially with the introduction of Kafalat in 2000.

Due to banking secrecy laws and banks' refusal to disclose their contributions to small and medium enterprises, it is impossible to assess individual banks' involvement in this area and this puts a lot of constraints on any recommendations that can be given towards improving access to credit.

Of the handful of banks that made public the amount of loans given to Small and Medium Enterprises, Bank of Beirut seems to lead the way with over 40% of its total loans going to this area. The total SME loan amounts given by Bank of Beirut hit 1,022,388 million LBP and 678.201 million dollars in 2008. Fransabank seems to be one of the main contributors as well, with 25.1% of loans going to SME. Bank Audi SAL, one the top three banks in Lebanon falls behind with only 9.2% of its loans going to SME. However, the amount of loans given by Bank Audi SAL was well over that given by Fransabank, with 851,330.837 million LBP and 564.73 million dollars (BilanBanques, 2008).

It is worth noting here that it is impossible to know how much of the loans given by those banks to SME are backed by Kafalat. Therefore, we cannot know how much banks give to SMEs separately.

### **3) Kafalat**

The Inception Report (Integrated SME Support Program, 2005) shows that one of the main reasons access to credit is limited is because banks often requires SMEs to provide significant collaterals. In response to this problem, Kafalat was established in 2000. Kafalat is the only credit guarantee scheme in Lebanon. It was introduced by the National Institute for the Guarantee of Deposits and fifty private banks with the collaboration of the Central Bank.

Private banks study SME loan applications, and the viable ones are passed on to Kafalat for guarantee approval. Kafalat approves the vast majority of loan guarantee applications, as they are run through the banks first.

Banks are usually eager to grant loans under Kafalat as 60% of the face value of the approved loans are exempted from the Reserve Requirements. Also, the Kafalat guarantee provides them with the reassurance that they need in terms of default risks. Kafalat insists that private banks do not to ask SMEs for additional collateral. Thus, Kafalat acts as an intermediary between SMEs and private banks, facilitating access to finance for businesses and reducing the risks of informational asymmetries for financial institutions. Furthermore, SMEs can take advantage of a Kafalat-backed loan, because the interests on those credits are subsidized by the Central Bank.

Kafalat provides three types of loan guarantees to small and medium enterprises.

The vast majority of SME are awarded a loan guarantee under the Kafalat Basic program. Of the 6,888 loan guarantee applications received between 2000 and 2009, 6,073 were under Kafalat Basic.

Kafalat Basic guarantees loans that have a maximum amount of 200,000 dollars, or 300,000,000 LBP. The value of the guarantee is equal to 75% of the loan amount, and the borrower can benefit from a grace period of 6 to 12 months. Thus, in case of default, Kafalat repays 75% of the loan amount and of the accumulated interest during the grace

period, to the lender. However, the borrower will still be responsible for the repayment of the full amount of the loan, and not just the remaining 25%. The borrower has to repay the loan within 7 years after the guaranteed loan is approved.

Kafalat underlines the importance of borrowing for the development and expansion of the concerned enterprise, whereas the guarantee will not be approved unless the loan will be used for this purpose. The loan has to be used in order to either establish or develop new activities, or to uphold and maintain the already existing ones.

The borrower can utilize the guaranteed loan in order to buy machines and equipment, spare parts and raw materials. The loan can be also used to cover construction costs and working capital, but not be directed towards this purpose only. Another restriction set by Kafalat is that the loan should be used to pay for expenditures incurred after it has been granted.

Kafalat aims to facilitate access to credit and encourages all types of small and medium enterprises in all industries and regions to borrow under one of their programs. Approved loan guarantees are distributed between industrial, agricultural and the tourism sectors, and with a few going to handcrafts and high technology. All regions benefit from the loan guarantees.

Kafalat supports all types of borrowers, whether it's an individual, a partnership, a limited liabilities company, a cooperative or a joint stock company. Also, the enterprise has to be established in Lebanon, but not necessarily Lebanese. Under the Kafalat Basic program the enterprise can also be a start-up.

As for the cost of the guaranteed loan, the borrower is responsible for paying back the value of the loan as well as the interests accrued over the grace period and the three months after it. Kafalat also charges a 2.5% commission.

For loans taken in Lebanese pounds, the interest rates charged by the lending banks are equal to 40% of the 1-year Lebanese Treasury Bills rates. For loans taken in dollars, interest rates are equal to the 1-year LIBOR rates to which is added 5.5%.

However, the costs of Kafalat loans are minimized, since the Lebanese Central Bank subsidizes interest rates for a maximum of 7%. Thus, in addition to the loan guarantees, subsidized interest rates encourage small borrowers to take out more loans and develop their activities.

Another program is Kafalat Plus, which offers guarantees for loans ranging from 4 million Lebanese pounds (or approximately 2,667 US dollars) to 600,000,000 LBP (or 400,000 dollars). In this case, Kafalat guarantees 85% of the loan amount and of the accumulated interest for the grace period and the three months after it.

For this program, Kafalat encourages SMEs which are able to export their products, or use local raw materials. It is also preferable if those enterprises are set in rural areas, where they can have a financial impact on their communities.

This program is also set to stimulate research and development, and enterprises that use new and innovative technologies or products.

In addition, a Kafalat Plus loan can be used to renovate and expand establishments, to promote and publicize the SME's activities and for research and development.

Also, in order to be eligible for this type of guarantee, Kafalat imposes more restrictions. For an existing SME, the borrowing enterprise should not have defaulted on any type of credit taken for at least three years, or two years for a start-up, before applying for

Kafalat Plus. Kafalat would also require the enterprise to present audited financial statements of its activities.

Kafalat Plus also requires the borrowing SME to cover 20% of the cost of the project, in cash or in kind. For borrowers who wish to expand, the debt to equity ratio of the SME should be 70/30.

Kafalat Innovative was designed to support innovative startups. Innovative startups are ones which develop new products or services, new production or business methods, or new forms of distribution and sales processes. Kafalat Innovative also encourages SME which offer “new uses for already existing products”.

Kafalat Innovative backs loans that have values between 4 million Lebanese Pounds to a maximum of 300 million Lebanese pounds. For this program, Kafalat guarantees 90% of the value of the loan and of the accrued interests during the grace period and the three months following. The borrowing startup has to be a Lebanese SME, which employs a majority of Lebanese workers. The borrowers should not have defaulted on any sort of credit in the two years prior to the application for the loan.

For this type of guarantee program, the borrower will have to cover a minimum of 10% of the costs of the project.

Kafalat Innovative and Kafalat Plus loans are given in order buy, maintain or expand SME properties, machines and equipment as well as working capital. They are also allowed to cover 15% of service costs and professional fees of the project.

The loans do not cover any expenses, even if related to the project, incurred before applying for the guarantee, unless a justification is given by the bank. The loans can cover costs only up to six months before applying for the guarantee.

Kafalat reports that since its establishment in the year 2000 until the end of 2009, the total value of guaranteed loans for Kafalat Basic reached 630,013,205,739 LBP (or 420,008,804 dollars), of which 363,119,579,523 LBP (or 242,079,720 dollars) are outstanding. For Kafalat Plus, the amount is 190,443,154,480 LBP (or 126,962,103 dollars), of which 173,571,414,746 LBP (or 115,714,276 dollars) are still outstanding. For Kafalat Innovative the value is 3,356,000,000 LBP (or 2,237,333 dollars), with only 14 guaranteed loans, of which 2,928,901,684 LBP (or 1,952,601 dollars) are outstanding. Other than the number and values of guaranteed loans, not much is known about the performance of the credit guarantee scheme. This is mainly due to the scarcity of data related to small and medium enterprises, their performances and their financing. Kafalat does not disclose information about the loans given by each bank nor the size of the operations of the borrowers, and preserves the anonymity of all of its clients.

## IV- Research Methodology

### 1) Data

Most of the past research done about small and medium enterprises in the MENA region relies on data collected from surveys. This study instead uses an exceptional set of data which we were the first to have access to, obtained from directly from Kafalat. It consists of all 6,888 loan guarantee applications submitted since the establishment of

Kafalat in 2000, until the end of 2009. Kafalat was however not able to disclose all the information available about borrowers and lenders.

Each borrower is identified by a number, allowing us to detect the returning customers. For each loan guarantee application, our dataset specifies the guarantee program, the type of the borrower, the value of the loan, the value of the guarantee (in percent), the sectors and area the SME is operating in and the decision as well as the date of the decision. The variables found in the dataset and used in the regressions are as follows (see Table 4):

- **Project:** Each SME in the dataset is referred to by a number. Hence, when a certain number is repeated, it means that the concerned SME borrowed several times under Kafalat. Of the 6,888 loan guarantee applications received, 4,977 are non repeat customers, or applied for Kafalat only once.
- **Program:** As mentioned before, Kafalat borrowers can apply for a loan guarantee under one of three different programs: Kafalat Basic, Kafalat Plus and Kafalat Innovative. The vast majority of the SME in our dataset borrowed under Kafalat Basic. Out of the 6,888 loan guarantee applications, 6,073 are under Kafalat Basic, 753 are under Kafalat Plus and only 14 under Kafalat Innovative. In fact, Kafalat Plus and Innovative were only established in 2006, are more specific and put more constraints on the borrowers.
- **Type:** We observe three types of borrowers in our dataset. Of the total loan applications, we count 3,574 individual borrowers, 2,679 enterprises and 587 partnerships (not taking into account returning customers). Of the total 4,977 non repeat customers, 2,902 are individuals, 1,590 are enterprises and 485 are partnerships.
- **The value of the loan:** depicts for each application, the total value of the loan that is covered or was intended to be covered (depending on decision) under a Kafalat program. This variable groups all loan values, whether in dollars or in Lebanese pounds. In total, there are 6,888 loan applications in Lebanese pounds, with a mean of 154 million LBP and standard deviation of 104 million LBP, and a minimum of 5.6 million LBP and a maximum of 300 million LBP. We also find 432 loan guarantee applications in dollars. These are characterized by a mean of 117,018.1 dollars and a standard deviation of 65,583.3 dollars. Here, we find a minimum of 6,000 dollars and a maximum of 200,000 dollars.
- **Value of the guarantee:** Due to privacy restrictions, we were unable to obtain the exact value of the guarantee of the loans, but we were given that value as a percentage. This value represents the percentage of the guarantee that backs the loan value and the interests accrued during the grace period and the three months after. Since, we only have the value of the loan but do not know the interest charged on the loan, we cannot use the guarantee rate to figure out the amount of the guarantee. We have three standard values for the guarantees, depending on the program that the borrower is applying to. Hence, for borrowers under Kafalat Basic, the value of the guarantee is 75% and for those under Kafalat Plus, it is 85%. As for SME under Kafalat Innovative, the value of the guarantee is 90%. Since both the variables program and value of the guarantee are perfectly correlated, we are only going to use the variable program in our regressions.
- **Level1 sector:** This variable represents the general sector in which the borrowing SME is operating. Our dataset includes five sectors: agriculture, handcraft, industry, advanced technologies and tourism. Of the total loan guarantee applications, 43.99% (or 3,009 loan guarantee applications) came from the industrial sector, which seems to be the biggest beneficiary of Kafalat. The second largest sector benefiting from the public guarantee

scheme is the agricultural sector, with 38.04% (or 2,602 loan guarantee applications) of the total loan guarantee applications. Kafalat loans have a lower share of borrowers in the other sectors, with the tourism sector contributing to 13.1% (or 896 loan guarantee applications) of all applications, the handcraft sector having 202 applications (or 2.95% of all applications), and the high technologies having only 131 applications (or 1.92% of all applications).

- **Level2 sector:** This variable represents the sub-sectors that the SME are operating in. We count 23 sub-sectors in our dataset, and the loan guarantee applications are spread among those sub-sectors.
- **Mouhafaza:** This variable refers to the governorates that the borrowing SME are operating in. We have six mouhafazat in Lebanon: Mount Lebanon, Bekaa, South Lebanon, North Lebanon, Beirut and Nabatiye. By looking at the data, we can see that Kafalat's biggest share is in Mount Lebanon, with 48.6% of all loan guarantee applications (or 3,324 loan guarantee applications). Mount Lebanon is followed by Bekaa, with only 17.12% of all loan guarantee applications (or 1,171 loan guarantee applications). The North and the South constitute respectively 11.42% and 10.98% of all loan guarantee applications (with respectively 781 and 751 loan guarantee applications). In the bottom, we find Beirut and Nabatiye with respectively 6.54% and 5.35% of all loan guarantee applications (respectively 447 and 366 loan guarantee applications).
- **Caza:** Our dataset contains a variable indicating the district that the SME is located in. There is a total of 28 Cazas. Again, we control for the Kadaa variable in our regressions, but the output is not reported in the tables.
- **Date:** Our dataset specifies the date of the application for the loan guarantee. The shows the day, month and year the guarantee was applied to. Our dataset comprises the entire Kafalat database since its establishment in the year 2000 until the end of 2009. Most of the loan guarantee applications were made in the last two years, with 15.19% and 17.22% of all loan guarantee applications for respectively 2008 and 2009. The year 2000 has by far the lowest number, with only 34 loan guarantee applications (or 0.5% of the total number). For repeat customers in our regression, we are going to take into consideration the date of the first loan guarantee application. We should note that days and months will not be taken into account in our regressions.

We should note that for all the different regressions, we dropped all applications that were rejected or cancelled. These observations were omitted as Kafalat only rejects or cancels an application due to administrative problems, or based on a client's request. The loan application is rejected if the client fails to provide the required information about his activities. It should be noted here that Kafalat facilitates the procedures for small clients who cannot provide adequate financial documents. Also, the concerned commercial bank has to approve the loan application prior to Kafalat. Thus, we do not see that rejected applications are part of the selection process of trusted clients.

## **2) Loan sizes**

We start by taking a closer look at the distribution of loan sizes across sectors and regions. The regressions of loan sizes only draw a picture of the general distribution of

Kafalat loans over the sectors and regions, and are thus a starting point for our analysis. We only observe what sectors and regions are taking the biggest loans. We cannot say why some sectors or regions have a tendency to borrow larger amounts than others.

We use Ordinary Least Squares (OLS) regressions to determine the distribution of loan sizes. The model is as follows

$$\text{Loan value}_i = \alpha_0 + \alpha_1 \text{ year}_i + \alpha_2 \text{ number of loans}_i + \alpha_3 \text{ level1sector}_i + \alpha_4 \text{ level2sector}_i + \alpha_5 \text{ Mouhafaza}_i + \alpha_6 \text{ Casas}_i + \alpha_7 \text{ Program}_i + \alpha_8 \text{ Type}_i + u_i$$

Where  $u_i$  : error

It should be noted that the dummies for the year each loan was taken in is not reported in the regression tables. In the regressions, we omit the industrial sector and the Mount Lebanon Mouhafaza. Looking at table 5, the results show that the coefficients of both the agriculture and handcraft sectors are negative and significant. The loan sizes in the agricultural sector are, on average, 12 million Lebanese Pounds smaller than those in the industrial sector, whilst in the handcraft sector the figure is as close as 65 million Lebanese Pounds.

The sector that took out the most significant loan sizes is the high technologies, with an average of 30 million Lebanese Pounds higher than those in the industrial sector. The results are not significant for the tourism sector.

These results can have different interpretations. The results suggest that the SMEs in the agricultural sector that are relying on Kafalat are mainly small clients, looking to improve their situation, but not necessarily trying to expand significantly their activities. This might mean that the bigger borrowers in the agricultural sector are relying on other sources of funding. Even with the relatively considerable sample size of the agricultural sector (2,602 observations), the loan sizes are much smaller than in other sectors, suggesting that it might not be that Kafalat is only attracting smaller clients in this sector, but also that the sector itself is mainly constituted of very small enterprises. In fact, for the agricultural sector, 2167 applications are for individuals, with 168 applications for enterprises. As for the industrial sector, 1875 applications are for enterprises and 939 are for individuals

For other sectors, such as high technologies, the borrowers are taking out much bigger loans, suggesting that bigger clients here are relying on Kafalat. If we were to consider the number of loan guarantee applications for the high technologies (only 191 out of the 6,888), one might think that in this sector, Kafalat is reaching only the bigger clients. As for the industrial sector, one might suspect that due to the nature of the sector and to the considerable sample size (3,009 observations), the loan sizes would be bigger than in other sectors. However, we can see that this sector was overtaken by the high technologies and that it doesn't have significantly bigger loan sizes than the tourism sector. This might suggest that the clients in this sector are very small, or that they might be relying on other sources of funding.

Concerning the regions, Mount Lebanon has the highest share of the loan guarantee applications (with 3,324 applications). When comparing the loan sizes, we can see that Beirut, receives Kafalat loans that are about 40 million LBP higher than those in Mount

Lebanon. The South of Lebanon also exhibits the same pattern, but with an average of 25 million Lebanese Pounds. We can ask here if the reason we observe this difference in loan sizes is that Mount Lebanon is more focused on agriculture than Beirut (we showed earlier that agricultural loans are significantly smaller than the industrial and tourism sectors).

In an attempt to answer that question, we hold the sectors constant. The results remain the same. It does not seem to be that the reason for these disparities is the nature of the industry in those regions. Similarly, we were concerned with the effect of the region on the sectors. The results are also unchanged, when we control for Mouhafazat and Cazas. These results point out that some regions have higher loans, but it is not because of the fact that those regions have a high concentration in SME belonging to certain sectors which exhibit the same pattern of high loans. Similarly, some sectors have bigger loans than others, but it is not due to the fact that those SME are located in regions characterized by high profile borrowing. We can thus say that SME in the South and Beirut are overall more attracted to bigger loans than other sectors, regardless of the industries they belong to. The same can be inferred for high technologies and the agricultural sectors, where SME overall in those sectors seem to be attracted to much bigger/smaller loans regardless of where they are located.

Another concern might be the fact that the reason why those sectors and regions are exhibiting certain patterns, is because they might be benefiting more from programs under which the sizes of the given loans are initially bigger (Kafalat Plus loans are bigger than Kafalat Basic) . We control for Kafalat programs, and the results remain the same, except for the agricultural sector. The patterns observed in Mount Lebanon, South of Lebanon and high technologies are independent of the Kafalat programs. The agricultural sector may be exhibiting the negative pattern, due to the fact that is borrowing under programs which offer smaller loans to their clients (Kafalat Basic).

The type of borrowers can also have an effect on the observed patterns (For example, enterprises are generally able to borrow bigger loans than individuals). The results do not change when controlling for types.

For high technologies and Beirut, we can only say that the SME seem to be more inclined towards borrowing bigger loans, but the reason for that is unknown. It could be that Kafalat is reaching the bigger clients in those sectors than in others. In other areas or sectors, big SME might prefer other sources of funding.

An interesting variable to look at here would be the number of loans taken per client. The coefficients for this variable show that with the increase in the number of loans taken, loan sizes tend to significantly decrease on average by 15 million Lebanese Pounds, suggesting that repeat customers may not be using their loans in order to significantly expand their activities. The variables concerning time suggest that the later clients tend to have bigger loan sizes (but only by 4.5 million Lebanese Pounds on average).

The regressions concerning loan sizes only allow us to see the distribution across different sectors and areas. The results can just be a reflection of the existing situation in those industries. For example, according to the inception report, the agricultural sector has 92.53% of its SME with less than five employees, whilst the number is 79.72% for the industrial sector. So, the SME in the industrial sector could be taking bigger loans because it is comprised of bigger SME which are in an initially better position to borrow. Another explanation could be that, Kafalat is only reaching bigger clients in some sectors

(like high technologies and Beirut, especially with the small sample size), and is only reaching the smaller clients like in the agricultural and industrial sectors, where bigger clients could prefer other sources of funding.

In order to expand our analysis, we will proceed by running a logit regression to determine if certain sectors or areas significantly encourage repeat customers (or if Kafalat is having a significant impact on a certain sector or area in terms of becoming a source of constant funding for SME wanting to expand their activities), and among repeat customers we will see if any sector or area is allowing for substantial expansion of its repeat borrowers (or among the repeat borrowers which are relying on Kafalat, is there evidence that those borrowers are expanding significantly their activities, or are they just trying to improve their situation).

### **3) Returning clients**

In the logit regression, we are concerned with the sectors and regions that show customers returning multiple times to borrow under Kafalat. Repeat customers are clients who are not just interested in using Kafalat loans to improve their situation in the short run, but are relying on Kafalat to continuously expand their activities over time. The determinants of Kafalat's repeat customers can inform our assessment of the efficiency of the credit guarantee scheme in stimulating significant expansion and growth in particular sectors or regions. We will take repeat customers as a proxy for expansion of SMEs. We argue that if a certain region or sector is exhibiting a significant positive pattern in terms of repeat customers, it means that Kafalat is becoming a constant source of funding for its SME clients in those sectors or regions, thus having a significant impact in terms of stimulating SME and continuous growth in those sectors. It should be noted here that Kafalat rarely refuses loan guarantee applications, and welcomes and facilitates any loan applications that will be used to expand the borrower's activities, regardless of the number of loans it has taken before.

We ran two sets of logit regression. The explanatory variables are mostly similar to those used in the regressions for loan sizes. However, in the first set (Table 6), we include as explanatory variable the mean value of loans for each SME. In the second set (Table 7), we use instead, the first loan taken by each SME. For both of these variables the results are similar. Here, we used dummy variables for the years that the first loan was taken in. For both tables, regression (1) includes all variables. Regression (2) drops the type of borrowers. Regressions (3) and (4) omit respectively the regions and sectors. For table 6, the initial date is also dropped in regressions (5) and (6) (in (6), sectors are also omitted).

The log odds of being a repeat customer decreases as the loan sizes increase, but the decrease is extremely small and insignificant.

For the handcraft industry, the coefficients throughout the regressions are negatively significant. The log odds of being a repeat customer decreases by 1.2, on average, if the SME is in the handcraft sector. This might not be a surprising result considering the nature of the sector. The result is also compatible with the small loan sizes taken out by this sector, as previously shown.

For the specialized technologies, the regressions show a significant negative correlation. The results are startling, considering that we have already shown that SME in the specialized technologies sector are taking out the biggest loans. The results from the logit regression show that even though SME in the specialized technologies sector are able or willing to take out much bigger loans than in other sectors, those SME don't seem to be willing to come back for more loans. The vast majority of the results point out that the log odds of being a repeat customer decrease on average by 0.9, when the SME is in the specialized technologies sector. The results remain the same when isolating the effect of regions (regressions 3 and 6). They become even more accentuated (-1.62), when we remove the effect of the date of the first loan taken by each SME. The only regression where specialized technologies are not significant is when we use the mean of loans and drop the type of borrowers. We can thus state that SME in the specialized sector take out or are more able to borrow more than other sectors, but for some reason, the clients are not returning for multiple loans.

For all other sectors and regions, the results are insignificant. Kafalat is not becoming a constant source of funding for its clients in any particular sector or region. It is not stimulating continuous expansion or growth among clients, even in the sectors or regions which are benefiting from a significant number of Kafalat loans (Mount Lebanon, Bekaa, Agriculture and Industry), or are taking out bigger loans than others (specialized technologies or Beirut).

Kafalat clients don't seem to be eager to use Kafalat loans more than once. This may have different interpretations. Kafalat clients could just not be interested or able to continuously expand their activities, or SME are using other sources of funding. However, since Kafalat is the only credit guarantee scheme in Lebanon, it can be argued that it is a good indicator of the situation of SME in Lebanon. SME in Lebanon seem to be hesitant when it comes to borrowing more than once, or to expand their activities, which may imply that the Lebanese economy is not providing the right environment for the development of these SME.

Another interpretation is that Kafalat is not the only source of funding for its clients. Kafalat clients could be using things like personal funds or relying on other programs that help SME.

If we were to look at other variables in these regressions, individuals have negative log log odds of 0.39, on average, of being repeat customers, relatively to enterprises. The coefficients for partnerships are not significant, where clients don't seem to be returning either more or less than enterprises.

For programs, SME that borrow their first loan under Kafalat Basic have negative log odds of 4.8 on average of being a repeat customer relatively to Kafalat Plus. However, the vast majority of clients borrow under Kafalat Basic, indicating that most repeat customers go to Kafalat Plus, which offers bigger loans, higher guarantees, and aims at promoting SME that have a significant impact on their environment. Kafalat Innovative exhibits perfect failure as its clients are all non repeaters because this program is for start-ups.

For Kafalat Innovative, there are only 14 observations, most of which are in Mount Lebanon and 3 in Beirut. The loans were all taken by enterprises, which operate in the high technologies (12 enterprises) and in the industrial sectors (2 enterprises).

The negative correlation between Kafalat Basic and Kafalat Plus can be attributed to, first of all, the type of returning clients under each program. In fact, all repeat customers under Kafalat Plus are enterprises, most of which are in the industrial sector. For Kafalat Basic, most returning clients are split between individuals (328 observations) and enterprises (223 observations). They are also split between the industrial and agricultural sectors, and have a higher concentration in high technologies than Kafalat Plus.

#### **4) Expansion of returning borrowers**

We take our analysis further by taking a closer look at only repeat customers in the dataset. The last set of regressions (Table 8) takes the ratio of the value of the last loan over the first loan acquired by each repeat customer. The goal of this set of regressions is to try and determine some sort of pattern in the evolution of loans sizes among repeat customers. Repeat customers are initially assumed to be the clients who find the terms of Kafalat loans suitable for them, and who are interested in constantly expanding their activities. We argue that if the ratio of last loan over first loan increases, it indicates that repeat customers are not only coming back for more loans, but they are also interested in acquiring bigger loans, or that they are interested in expanding their activities more than they have when they first borrowed under Kafalat. This can indicate that since acquiring their first loans from Kafalat, repeat customers may have had a successful expansion and are now in better financial position to borrow bigger loans. It can also indicate that those repeat customers have been more motivated since their first loan to significantly develop their activities.

Here, we control for the date the first loan was acquired by the repeat customer. This variable is positive and significant, indicating an increase of on average of 0.07 in the ratio of last loan over first loan, with the increase in initial date. We also control for the value of the first loan taken by each repeat customer. The coefficients are significant but extremely small to be considered for further analysis. The third value that we control for is the duration (in years) between the first loan and the last loan taken by each repeat customer. This variable is positive and significant, with an average increase of 0.1 in the ratio of last loan over first loan, with every increase of one year in the duration. The number of loans taken by each repeat customer is insignificant across all regressions. For individuals and partnerships, the coefficients are negative and significant across all regressions. However, the ratio goes down even more when the borrower is initially a partnership (on average by 0.45), than if the client is initially an individual (on average by 0.25) relatively to enterprises.

For programs, the ratio significantly decreases on average by 1.05, when a client initially borrows under Kafalat Basic as opposed to Kafalat Plus. Again, Kafalat Innovative here is dropped, as it only deals with start-ups. The results concerning programs are somewhat expected, considering that Kafalat Plus offers bigger loans and loan guarantees, and the difference in the nature of the borrowers under those two programs. In fact, all individual and partnership repeat clients borrow initially under Kafalat Basic, while Kafalat Plus is initially used by only repeat enterprises clients.

When looking at sectors and regions, the only significance is seen at the level of the Beirut Mouhafaza. The ratio of last loan over first loan grows at an average of 0.8 in

Beirut, relatively to the Mount Lebanon Mouhafaza. Repeat customers in the Beirut mouhafaza are thus not only taking out multiple loans, but are also increasing the sizes of the loans and the sizes of their expansions and their activities. The coefficient for the Beirut Mouhafaza is, however, non significant when we drop the type of borrowers and significant when controlling for it, suggesting that the significance in the Beirut Mouhafaza is mainly due to the fact that the vast majority of repeat Beirut clients are enterprises. In fact, out of the 62 repeat customers in Beirut, 53 are enterprises, while only 7 are individuals and 2 are partnerships. The Beirut Mouhafaza is also insignificant when the program under which the first loan is acquired, is dropped and significant when controlling for it. In fact, half of the Beirut repeat customers take their first loan under Kafalat Plus, while most of the first loans of repeat customers in Mount Lebanon are under Kafalat Basic (321 repeat clients borrow initially under Kafalat Basic, while 180 borrow initially under Kafalat Plus).

Regression1 also shows significance at the level of the Nabatiye Mouhafaza. The ratio of last loan over first loan goes up on average by 1.25 for Nabatiye relatively to Mount Lebanon. However, the result is insignificant for all other regressions. It is, thus, deemed inconclusive and cannot be held for further analysis.

Among repeat customers, the ratio of last loan over the first seems to significantly increase only for the Beirut Mouhafaza. This result suggests those SME not only borrow multiple times under Kafalat, but are also interested and able to expand their activities more than they have when they initially borrowed under Kafalat. Repeat customers in Beirut are exhibiting a positive growth in their activities and Kafalat is offering them the resources to do that. It should be noted here that we do not assume that repeat clients in other regions or sectors are not experiencing an expansion or growth. However, for Beirut, this expansion is getting bigger over time, giving evidence that Kafalat is having a substantial impact on this particular group. Nevertheless, these results could be due to the fact that repeat customers in Beirut are initially in a better position than in other sectors or regions. In fact, the vast majorities of repeat clients in Beirut borrows under Kafalat Plus and are enterprises.

## V- Conclusion

The aim of this paper was to add to the scarce literature existing about small and medium enterprises in Lebanon. Our paper first starts by painting a picture of the general distribution of loans, backed by the Lebanese credit guarantee scheme. We show that the regions and sectors that are receiving the highest number of loans are not the ones benefiting from the biggest loan sizes. We find that SME in the specialized technologies sector and the Beirut Mouhafaza are inclined to borrow the biggest loans, while the agricultural sector falls behind. These results can be seen as an indicator of the ability of SME to borrow in the different regions and sectors (SME in the industrial sector are bigger than those in the agricultural sector). We may also interpret them as Kafalat

attracting only the bigger clients in some areas, and reaching only small clients in other sector or regions, where bigger clients may rely on other sources of funding. In this context, we suggest that an effort should be made in order to enable the credit guarantee scheme to reach even smaller clients in Beirut and the specialized technologies sector, but to also to reach the bigger clients in sectors like the agricultural one. We then proceed by running a set of logit regressions, in an attempt to determine the sectors and regions that have clients which borrow multiple times under Kafalat. We assume that repeat clients are the ones who use Kafalat to continuously expand their activities over time, not just in the short run. We find that the regions and sectors that are benefiting from the highest number of loans and the biggest loan sizes are not necessarily the ones that exhibit a pattern of returning clients. We find that SME in the specialized sector take out or are more able to borrow more than other sectors, but for some reason, it exhibits a negative pattern for returning clients. For all other sectors and regions, Kafalat is also not becoming a constant source of funding for its clients. It would be interesting to examine in later research the causes for this pattern. What makes SME that are able to borrow not return to Kafalat to expand their activities? This can have various interpretations. SME that initially borrowed under Kafalat may not have found the terms of the loans suitable for them, which made them reluctant to come back and borrow multiple times. We can also think that the terms of the loans are convenient, but SME are just not interested in expanding their activities even further. This can be related to the general economic environment, which may not be stimulating SME to expand substantially and continuously. Finally, we take our analysis one step further by studying the patterns across regions and sectors of the ratio of last loan over the first, taken by each repeat client. Among returning clients, only those in the Beirut Mouhafaza borrow significantly larger loans after their first loan. Thus, Kafalat is becoming a constant significant source for expansion and growth for returning clients in Beirut. However, across all other sectors and regions, the observed expansion among returning clients does not seem increasing over time, or after the first loan. These results give us a basis for further analysis later on. They put into question the efficiency of the credit guarantee scheme in terms of becoming a constant and continuous source of funding for its clients in the long run, as opposed to just helping SME develop their activities only once. They also allow us to question the general economic situation in Lebanon and whether or not the government is motivating and providing SME with a secure environment for them to be willing and able to develop their activities even further.

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Table 1: Size distribution of SME per Mouhafazat (Comparison of the results of the Central Administration of Statistics and the Consultation and Research Institute)

Mouhafazat Size	Preliminary field survey results				CAS results			
	<5	5-9	10-49	Total	<5	5-9	10-49	Total
Beirut	83%	12%	5%	100%	85%	9%	6%	100%
Mount-Lebanon	89%	7%	4%	100%	90%	6%	4%	100%
North	96%	3%	1%	100%	94%	4%	2%	100%
Bekaa	94%	3%	2%	100%	95%	3%	2%	100%
South	96%	3%	1%	100%	94%	4%	2%	100%
Nabatieh	95%	4%	1%	100%	95%	3%	1%	100%
Total	93%	5%	2%	100%	92%	5%	3%	100%

Source: Consultation and Research Institute, Micro and Small Enterprises in Lebanon, 2005

Table 2: Value of collateral needed for a loan (% of loan amount) for selected countries

	Value of collateral needed For a loan (% of loan amount)
Lebanon (2009)	160.59
Egypt (2008)	85.47
Jordan (2006)	127.99
Syria (2009)	124.05
Morocco (2007)	171.24
MENA region	150.91

Source: Enterprise Surveys, The World Bank Group

Table 3

	Domestic credit provided by banking sector as % of GDP	Domestic credit to Private sector as % of GDP
Lebanon	169.42	74.36
Egypt	77.69	42.79
Jordan	114.919	83.76
Syria	37.35	15.82
Morocco	95.54	77.43
Tunisia	72.04	65.77
MENA region	43.78	52.64

Source: World Bank Development Indicators, 2008

Table 4: Summary of data

		Number of observations	Mean value of loans (LBP)	Standard Deviation	Min	Max
Program	Kafalat Basic	6,073	1.42e+08	9.95e+07	6.60e+07	3.00e+08
	Kafalat Plus	753	2.59e+08	7.52e+07	5,600,000	3.00e+08
	Kafalat Innovative	14	2.40e+08	7.98e+07	6,000,000	3.00e+08
Type	Enterprises	2,679	2.17e+08	9.29e+07	6,000,000	3.00e+08
	Individuals	3,574	1.11e+08	8.84e+07	5,600,000	3.00e+08
	Partnerships	587	1.42e+08	9.54e+07	1.10e+07	3.00e+08
Level sector	Agriculture	2602	1.16e+08	9.36e+07	5,600,000	3.00e+08
	Handcraft	202	8.18e+07	7.91e+07	6,750,000	3.00e+08
	Industry	3009	1.78e+08	1.01e+08	6,000,000	3.00e+08
	High Technologies	131	2.00e+08	9.71e+07	1.50e+07	3.00e+08
	Tourism	896	2.00e+08	1.00e+07	1.00e+07	3.00e+08
Mouhafaza	Beirut	447	2.01e+08	9.82e+07	1.00e+07	3.00e+08
	Bekaa	1171	1.39e+08	9.62e+07	5,700,000	3.00e+08
	Mount Lebanon	3324	1.65e+08	1.06e+08	5,600,000	3.00e+08
	Nabatiye	366	1.19e+08	9.62e+07	1.00e+07	3.00e+08
	North Lebanon	781	1.48e+08	1.02e+08	6,750,000	3.00e+08
	South Lebanon	751	1.34e+08	1.00e+08	6,000,000	3.00e+08

Source: Kafalat database

Table 5: Regressions with loan sizes as dependent variable

	(1)	(2)	(3)	(4)	(5)
Number of Loans	-1.232e+07*** (2.5e+06)	-1.279e+07*** (2.5e+06)	-1.213e+07*** (2.5e+06)	-2.1e+06 (2.4e+06)	-1.098e+07*** (2.7e+06)
Agriculture	-1.243e+07* (5.4e+06)	-1.424e+07** (5.4e+06)		-1.022e+07 (5.4e+06)	-3.134e+07*** (5.6e+06)
Handcraft	-6.585e+07*** (7.2e+06)	-6.572e+07*** (7.2e+06)		-6.513e+07*** (7.2e+06)	-8.306e+07*** (7.5e+06)
High technologies	2.94e+07* (1.14e+07)	3.62e+07** (1.12e+07)		2.94e+07** (1.13e+07)	3.95e+07*** (1.14e+07)
Tourism	1.79e+07 (2.33e+07)	1.4e+07 (2.41e+07)		1.65e+07 (2.33e+07)	2.28e+07 (2.24e+07)
Beirut	3.89e+07** (1.48e+07)		4.20e+07** (1.62e+07)	4.06e+07** (1.49e+07)	4.14e+07** (1.51e+07)
Bekaa	2.91e+07 (2.21e+07)		4.10e+07 (2.18e+07)	2.62e+07 (2.21e+07)	9.30e+06 (2.54e+07)
Nabatiye	-1.063e+07 (1.26e+07)		-5.43e+06 (1.49e+07)	-1.297e+07 (1.27e+07)	-3.214e+07* (1.34e+07)
North Lebanon	8.28e+06 (1.62e+07)		9.84e+06 (1.65e+07)	8.18e+06 (1.66e+07)	-7.58e+06 (1.57e+07)
South Lebanon	23390517.791** (8692006.61)		30892913.130*** (8988304.86)	22840013.715** (8716422.20)	14336084.145 (9358179.84)
Innovative Start ups	2.51e+07 (2.57e+07)	1.93e+07 (2.47e+07)	1.85e+07 (2.14e+07)		4.76e+07 (2.58e+07)
Kafalat Plus	5.37e+07*** (5.13e+06)	5.31e+07*** (5.05e+06)	5.73e+07*** (5.00e+06)		8.52e+07*** (5.21e+06)
Individual Partnership	-7.867e+07*** (3.39e+06)	-8.098e+07*** (3.22e+06)	-8.977e+07*** (3.13e+06)	-8.527e+07*** (3.29e+06)	
	-5.117e+07*** (5.08e+06)	-5.424e+07*** (4.99e+06)	-5.401e+07*** (5.06e+06)	-5.759e+07*** (5.04e+06)	
constant	-8.467e+09*** (1.17e+09)	-8.738e+09*** (1.16e+09)	-8.892e+09*** (9.59e+08)	-1.155e+10*** (1.11e+09)	-9.114e+09*** (1.22e+09)
R-sqr	0.317	0.298	0.276	0.307	0.248
dfres	5634	5634	5634	5634	5634

\*p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 6: Logit regressions for repeat clients using the mean of loans by project

	(1)	(2)	(3)	(4)	(5)	(6)
Mean of loans	-2.37e-09***	-1.96e-09***	-2.38e-09***	-2.17e-09***	-3.05e-09***	-3.06e-09***
By project	(5.34e-10)	(5.05e-10)	(5.24e-10)	(5.19e-10)	(5.30e-10)	(5.21e-10)
Agriculture	-0.156 (0.18)	-0.218 (0.17)	-0.205 (0.17)		-0.126 (0.18)	-0.200 (0.17)
Handcraft	-1.213** (0.42)	-1.245** (0.41)	-1.181** (0.41)		-1.669*** (0.41)	-1.619*** (0.41)
High technologies	-0.850* (0.43)	-0.838 (0.43)	-0.928* (0.42)		-1.123** (0.44)	-1.173** (0.43)
Tourism	-0.003 (0.79)	-0.004 (0.79)	0.113 (0.78)		-0.453 (0.66)	-0.317 (0.65)
Beirut	0.847* (0.43)	0.915* (0.43)		0.720 (0.42)	0.331 (0.43)	
Bekaa	1.168 (0.81)	1.096 (0.81)		1.180 (0.79)	0.477 (0.37)	
Nabatiye	-0.437 (1.06)	-0.508 (1.06)		-0.431 (1.05)	-1.199 (1.05)	
North Lebanon	-0.443 (0.78)	-0.477 (0.77)		-0.353 (0.78)	-1.774 (0.76)	
South Lebanon	0.411 (0.39)	0.372 (0.39)		0.202 (0.38)	-0.296 (0.38)	
Kafalat Basic	-4.810*** (0.20)	-4.918*** (0.20)	-4.740*** (0.20)	-4.673*** (0.20)	-3.979*** (0.18)	-0.405*** (0.18)
Individual	-0.324* (0.13)		-0.369** (0.12)	-0.4493*** (0.12)	-0.337** (0.12)	-0.391* (0.12)
Partnership	-0.328 (0.18)		-0.403* (0.18)	-0.468** (0.18)	-0.302 (0.18)	-3.933*** (0.18)
constant	550.045*** (47.34)	549.233*** (47.21)	531.440*** (46.49)	516.147*** (38.48)	-1.028 (1.42)	-0.791 (1.26)
Pseudo R2	0.2410	0.2396	0.2286	0.2320	0.2114	0.2000

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

The results (not reported here but available from author) are qualitatively similar when probit or a linear probability model is used instead of logit.

Table 7: Logit regressions for repeat clients using the value of the first loan taken by each client

	(1)	(2)	(3)	(4)
Initial loan values	-1.89e-09*** (5.17e-10)	-1.53e-09** (4.89e-10)	-1.90e-09*** (5.07e-10)	-1.73e-09*** (5.02e-10)
Agriculture	-0.138 (0.18)	-0.193 (0.17)	-0.190 (0.17)	
Handcraft	-1.187** (0.41)	-1.214** (0.41)	-1.155** (0.41)	
High technologies	-0.842* (0.43)	-0.841* (0.43)	-0.926* (0.42)	
Tourism	0.041 (0.67)	0.030 (0.67)	0.147 (0.66)	
Beirut	-0.650 (0.77)	-0.699 (0.77)		0.706 (0.42)
Bekaa	1.203 (0.37)	1.137 (0.81)		1.088** (0.36)
Nabatiye	1.351* (1.06)	1.294 (1.06)		1.232 (0.68)
North Lebanon	-0.428 (0.78)	-0.461 (0.78)		-1.487 (0.78)
South Lebanon	0.344 (0.40)	0.297 (0.40)		0.228 (0.40)
Individual	-0.296* (0.13)		-0.337** (0.12)	-0.417*** (0.12)
Partnership	-0.336 (0.18)		-0.403* (0.18)	-0.472** (0.18)
Kafalat Basic	-4.820*** (0.20)	-4.922*** (0.20)	-4.753*** (0.20)	-4.706*** (0.20)
constant	556.588*** (47.39)	554.957*** (47.25)	537.668*** (46.55)	528.869*** (38.72)
Pseudo R2	0.2422	0.2409	0.2299	0.2335

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

The results (not reported here but available from author) are qualitatively similar when probit or a linear probability model is used instead of logit

Table 8 : Regression with the ratio of the values of the last loan over the first loan taken by each returning client

	(1)	(2)	(3)	(4)	(5)	(6)
Initial loan values	-8.18e-09*** (5.10e-10)	-8.12e-09*** (5.08e-10)	-7.99e-09*** (5.07e-10)	-6.86e-09*** (0.00)	-7.35e-09*** (0.00)	-6.19e-09*** (0.00)
Duration between first and last loan	0.103*** (0.03)	0.107*** (0.03)	0.101*** (0.03)	0.075** (0.03)	0.103*** (0.03)	0.068** (0.03)
Number of loans	0.014 (0.09)	0.048 (0.09)	0.027 (0.09)	-0.010 (0.09)	0.022 (0.09)	0.025 (0.09)
High technologies	0.649 (0.38)	0.727 (0.38)		0.467 (0.38)	0.641 (0.37)	0.415 (0.38)
Handcraft	-0.097 (0.40)	0.004 (0.40)		-0.012 (0.40)	0.103 (0.39)	0.001 (0.41)
Agriculture	-0.112 (0.15)	-0.166 (0.15)		-0.004 (0.15)	-0.136 (0.14)	-0.056 (0.15)
Tourism	0.023 (0.74)	0.012 (0.74)		-0.606 (0.60)	-0.102 (0.59)	-0.764 (0.61)
Beirut	0.887** (0.33)		0.800* (0.33)	-0.225 (0.33)	0.025 (0.32)	-0.114 (0.33)
Bekaa	-0.480 (0.76)		-0.635 (0.75)	-1.022 (0.75)	-0.468 (0.74)	-0.991 (0.76)
Nabatiye	1.254* (0.64)		0.874 (0.63)	1.192 (0.64)	1.073 (0.61)	0.953 (0.64)
North Lebanon	0.149 (0.64)		0.124 (0.62)	-0.011 (0.64)	0.168 (0.62)	0.003 (0.64)
South Lebanon	-0.135 (0.35)		-0.301 (0.35)	-0.039 (0.35)	-0.090 (0.34)	-0.047 (0.35)
Kafalat Basic	-1.049*** (0.14)	-1.042*** (0.14)	-1.172*** (0.13)		-1.086*** (0.14)	
Individual	-0.226* (0.12)	-0.259* (0.11)	-0.250* (0.11)	-0.408*** (0.11)		

Partnership	-0.450* (0.18)	-0.430* (0.17)	-0.468** (0.17)	-0.666*** (0.18)		
constant	-140.327* (61.14)	-145.106* (61.12)	0.848 (52.89)	-319.302*** (54.61)	-130.914* (59.41)	-350.564*** (54.75)
R-sqr	0.355	0.312	0.322	0.309	0.344	0.292
dfres	813	841	834	814	815	816

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001