Entrepreneurial Motivation and Business Performance: Evidence from a French Microfinance Institution

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Abstract

This article examines the link between entrepreneurial motivation and business performance in the French microfinance context. Using hand-collected data on business microcredits from a Microfinance Institution (MFI), we provide an indirect measure of entrepreneurial success through loan repayment performance. Controlling for the endogeneity of entrepreneurial motivation in a bivariate probit model, we find that "necessity entrepreneurs" are more likely to have difficulty repaying their microcredits than "opportunity entrepreneurs". However, type of motivation does not appear to make a difference to business survival. We build a stylized model to develop formal arguments supporting this outcome. We test for the robustness of our results using parametric duration models, and show that necessity entrepreneurs experience difficulties in loan repayment earlier than their opportunity counterparts, corroborating our initial findings.

Keywords opportunity and necessity entrepreneurs; business microcredit; loan repayment; business survival

JEL classification C30, C41, G21, L26, M13

1 Introduction

The microcredit is an innovative way to address financial and social exclusion. Microcredits are particularly small loans to poor individuals who cannot easily access mainstream financial markets. We distinguish between two main categories of microcredit, business and personal loans.[1] Business microcredits are intended for business start-up and development, to foster self-employment. Personal loans target personal and family development projects. In this paper, we use a hand-collected data set on business microcredits from a French Microfinance Institution (MFI) to study the relationship between entrepreneurial motivation and business performance, in terms of loan repayment and business survival.

Despite strong enthusiasm among the proponents of the microcredit, the evidence regarding its impact has so far been mixed (Armendáriz and Morduch, 2010). Findings from a number of rigorous studies based on randomized controlled trials on the statistical impact of the microcredit are inconclusive (Banerjee et al., 2015). However, Newman et al. (2014), performing a qualitative study, argue that microcredits can generate sound entrepreneurial activity and improved business outcomes. The European Union subsidizes business microcredit, seen as a stimulus to entrepreneurial initiatives that will combat unemployment. In France, where the state actively promotes entrepreneurship as a way out of unemployment, microfinance is perceived as a valuable tool.

It is widely recognized that entrepreneurship generates economic growth (Reynolds et al., 2005; Audretsch and Thurik, 2001). In the European Union in 2012, almost 93% of all businesses were micro-enterprises (employing fewer than 10 people). Micro-enterprises made the second highest contribution in terms of employment and value added, after large firms (employing more than 250 people) (Eurostat, 2015).

Considerable research effort has been directed toward identifying the determinants of entrepreneurial performance. One important aspect of this research is distinguishing among different typologies of entrepreneurs (Wennekers and Thurik, 1999). Entrepreneurial typologies can, for instance, be defined according to owners' motivation. Since 2001, the Global Entrepreneurship Monitor (GEM) distinguishes between two different types of entrepreneurial motivation, translating into necessity and opportunity entrepreneurship. Distinguishing between these two types is important, both from theoretical and practical standpoints (Block and Wagner, 2010). Opportunity entrepreneurs start a business voluntarily, to take advantage of new opportunities. In contrast, necessity entrepreneurs get involved in a business because they have difficulties remaining in the paid job market. They can be described as requirement-based (Block and Sandner, 2009) or against-their-will (Korunka et al., 2003) entrepreneurs. According to the existing literature, there are significant differences between the two types of entrepreneurs. First, in terms of individual characteristics, necessity entrepreneurs are generally older (Wagner, 2005; Bhola et al., 2006; Block and Sandner, 2009; Block and Wagner, 2010), either less (Bhola et al., 2006) or equally (Block and Sandner, 2009) educated and less likely to have a parent involved in entrepreneurship (Wagner, 2005; Bhola et al., 2006).

As suggested by Esther Duflo, the microfinance industry now needs to distinguish between necessity and opportunity entrepreneurs, in order to provide them with appropriate services (Duflo, 2010). According to the GEM survey in 2003, two-thirds of entrepreneurs report opportunistic motivation, while one-third say they are acting out of necessity. However, there is great heterogeneity across countries, with developed countries having a larger proportion of opportunity entrepreneurs (Reynolds et al., 2005).

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[1]Sometimes, Microfinance Institutions do not differentiate between two types of products, since the boundary between the business and the household is not clearly drawn.

Microfinance is a new and relatively under-researched domain in the entrepreneurship literature (Newman et al., 2014). Microfinance is often viewed in Europe as a social policy aimed at encouraging self-employment as a way out of unemployment ("push" reasons). In particular, poor individuals facing low-paid employment are more likely to start a business out of necessity, to meet basic human needs (Naudé, 2010). Jaouen and Lasch (2015) argue that the subsistence type of entrepreneur is specific to micro-firms, the main target of MFIs. However, traditional banks are reluctant to finance micro-entrepreneurs willing to start a business for "pull" reasons but lacking any initial capital or credit history. These riskier projects are typical of MFI clients. Consequently, using a data set from an MFI to study entrepreneurial motivation is particularly relevant. We expect our data set to be balanced in terms of the proportions of necessity and opportunity entrepreneurs.

There are different ways to assess entrepreneurial performance. Existing studies have mainly focused on such measures of performance as business survival, employment or turnover growth. Using growth as a sign of performance is particularly tricky, since a meaningful proportion of entrepreneurs *choose* not to grow (Jaouen and Lasch, 2015). But many micro start-ups require access to credit to get going.[2] Therefore, loan repayment is a reasonable alternative measure of business performance, that is not affected by individual choice not to grow. Interestingly, to the best of our knowledge, none of the existing studies have focused on the loan repayment performance of different types of micro-entrepreneurs. We fill this gap by investigating whether necessity entrepreneurs are different from their opportunity counterparts in terms of loan repayment. To link our findings with the existing literature, we will perform parallel business survival analysis, exploring whether necessity entrepreneurs are more likely than opportunity entrepreneurs to close their businesses, as some previous studies suggest (Millán et al., 2012; Oberschachtsiek, 2012; Andersson and Wadensjo, 2007), or whether there is no significant difference between them (Block and Sandner, 2009).

The literature on microfinance in Europe is scarce, mainly because the industry is relatively young and there is not yet a clear distinction between microcredits and other types of loans (European Commission, 2012). Moreover, MFIs in Europe serve a niche market.[3] According to Bendig et al. (2012) the five main goals of MFIs in Europe are job creation, promotion of micro- and small enterprises, financial and social inclusion and, to a lesser extent, the empowerment of particular target groups (women, migrants, etc.).

The major financial product is the microcredit, with a special focus on the business microcredit.[4] Non-financial services, mainly in the form of business support, are the second major product provided by European MFIs.

Most MFIs in Europe are subsidized by national or local governments. This is not surprising, since subsidies are crucial for MFIs, especially during their start-up phase (Hudon and Traça, 2011). Historically, even major MFIs in developing countries have widely benefited from direct or indirect subsidies (see Morduch, 1999, for the Grameen Bank case). Moreover, lack of subsidies can result in socially harmful trade-offs (D'Espallier et al., 2013). Nevertheless, the relationship between non-financial services, and subsidization is tricky, since indirect subsidies can decrease the incentives for

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[2]In France in the first semester of 2002, almost 36% of all business start-ups were (partly) financed by commercial bank loans (source: authors' own computations using data from the French National Institute of Statistics and Economic Studies). Furthermore, commercial banks are the main providers of small-business finance, according to Berger and Udell (2002).

[3]Reed et al. (2014) report that MFIs in the industrialized world represent 4.4% of total MFIs reporting to the Microcredit Summit Campaign, serving less then 3% of microfinance clients.

[4]The European Commission defines the microcredit as a loan of up to EUR 25,000 tailored for micro-enterprises employing less than 10 people (91% of all European firms), and unemployed or inactive people who want to go into self-employment but do not have access to traditional banking services (European Commission, 2009).

MFIs to provide business training to their clients (Bourlès and Cozarenco, 2014). The abundance of subsidies may also explain the scarcity of complementary financial products such as microsavings (Cozarenco et al., 2016).

In this context, studying the performance of MFI clients is crucial in terms of policy implications. Block and Sandner (2009) contest the suggestion that necessity entrepreneurs are less desirable from an economic standpoint, as in Acs and Varga (2005) for instance. Insofar as they do not exhibit unequal survival rates, Millán et al. (2012) and Block and Sandner (2009) argue that public support to initially unemployed or necessity entrepreneurs is justified. However, these studies do not look at the quality of the surviving businesses. In this paper, we use an indirect strategy to infer business success through the loan repayment behavior of micro-borrowers from a French MFI.

We first sketch a stylized model illustrating the link between entrepreneurial motivation and business performance. In the empirical model, we focus on two different measures of performance, i.e. microcredit repayment and business survival, using hand-collected data from a French MFI. This paper is novel in addressing the link between entrepreneurial motivation and performance in the microfinance context.

The rest of the paper proceeds as follows. In the next section we develop a stylized model to formalize this relationship. Then our data set and the descriptive statistics are introduced, followed by the presentation of the econometric model and results. We then test for robustness of our results. Finally, we discuss our main findings and conclude.

2 Necessity versus opportunity entrepreneurs: A theoretical framework

In this section, we analyze the link between entrepreneurial motivation and business performance from a theoretical point of view. To do so, we first examine the key differences between necessity and opportunity entrepreneurs. We argue that these differences mainly lie in the non-pecuniary benefits from entrepreneurship and external (employment) opportunities (i.e. the opportunity cost of entrepreneurship), leading to an ambiguous effect of entrepreneurial motivation on business performance.

Several empirical papers point out the non-pecuniary benefits from entrepreneurship (or self-employment). Hamilton (2000) notably shows that the difference in earnings between employed and self-employed individuals cannot be explained by self-selection. In the same vein, Benz and Frey (2008) show that pay (or material) differences cannot fully explain the discrepancies in job satisfaction between the two groups (this was also highlighted by Blanchflower, 2000).

These non-pecuniary benefits seem to be linked to independence, autonomy or skill utilization (see Benz and Frey, 2008; Hundley, 2001; Lange, 2012). From a theoretical point of view, such benefits can be related to the concept of intrinsic motivation introduced by Benabou and Tirole (2003). From our perspective, in line with the above discussion, intrinsic motivation or non-pecuniary benefits should be rather limited for necessity entrepreneurs, who are by definition mainly driven by monetary motives. At least, intrinsic motives should be stronger for opportunity entrepreneurs, for whom entrepreneurship is clearly a choice.

This difference is expected to lead to better performance for opportunity entrepreneurs. However, this has to be balanced with the fact that they also enjoy better external opportunities. As previously pointed out, opportunity entrepreneurs appear to be better educated (Bhola et al., 2006) and also to benefit from better (or more) alternative employment opportunities (Bergmann and Sternberg, 2007). As a result, businesses founded by opportunity entrepreneurs could close earlier, as they might be

offered better job opportunities or expect higher returns for remaining in business.

Therefore, on the one hand, businesses run by opportunity entrepreneurs should perform better because of higher (intrinsic) motivation; but, on the other hand, they could close more often because of higher opportunity cost of entrepreneurship.

To that extent, the theoretical predictions concerning the link between entrepreneurial motivation and business performance seem to be ambiguous. We formalize this argument in a stylized model presented in the Appendix where we adapt the canonical model of Tirole (2006) to account for micro-credit specificity and differences between necessity and opportunity entrepreneurs. We show that the probability of success of a business increases in the entrepreneur's intrinsic motivation and decreases in her external opportunity. This result suggests an ambiguous effect of entrepreneurial motivation on business survival and call for deeper empirical examination. This is the aim of the remainder of this paper.

3 Methodology

3.1 Institutional background and data

Our sample contains micro-firms started by the clients of a French MFI, created in 2006 and operating in the Provence-Alpes-Côte-d'Azur (PACA) region as a non-profit Non-Governmental Organization (NGO). It was created at the initiative of a commercial bank under its corporate social responsibility policy. Its target clients are individuals who have difficulty accessing credit from mainstream banks. The MFI does not require any collateral or guarantees from its clients. Each entrepreneur can apply only once for a microcredit. The MFI aims for financial inclusion of all borrowers after granting the first microcredit.[5] It operates in collaboration with public organizations which provide business development services and follow-up at different stages. We focus exclusively on business microcredits in our analysis.

Most of the MFI's clients are (long-term) unemployed, have low education and income levels and are starting a business for the first time. Many of the clients are becoming self-employed to avoid unemployment and/or poverty. Therefore, we expect to observe a relatively large proportion of necessity entrepreneurs in our sample compared to previous studies (see Block and Sandner, 2009, Table 6 for studies in the German context where necessity entrepreneurs represent between 6.7% and 45.5%). In this context, it is particularly relevant to investigate the performance of both types of entrepreneurs (necessity and opportunity) in terms of loan repayment and business survival.

The average loan granted in our sample is EUR 8,250, for a period of 52 months (repayments take place monthly) at an average annual interest rate of 4.4%. The interest rate is fixed by the MFI and does not vary according to personal or project characteristics, which is a specific feature of microfinance worldwide.

Our data set is built using several sources. It includes five different types of information:

1. Individual and business characteristics.

2. Repayment history within the MFI.

3. Business survival status and date of closure when applicable.

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[5]As a consequence, the MFI does not provide dynamic incentives through progressive lending (Armendáriz and Morduch, 2010).

4. Information on entrepreneurial motivation.

5. Data on business cycles at PACA-region level by sector of activity.

Individual and business characteristics and repayment history were provided directly by the MFI. Information on repayment histories was last updated in January 2016.

Information on business survival was collected and updated in March 2016 from the French website www.societe.com, containing general information about both closed and active French firms. Interestingly, the 3-year survival rate in our sample is 83%, whereas it is 68%[6] for the PACA region, according to national statistics. Similarly, the 5-year survival rate is higher in our sample (66% versus 55% for PACA region).

Further, to differentiate between types of entrepreneur (necessity or opportunity), we conducted a survey among the clients of the MFI. Of the 574 granted loans (between April 2008 and April 2012), 294 micro-entrepreneurs agreed to participate in the survey, a 51% response rate. A combination of web (20% of respondents) and telephone (80% of respondents) survey methods were used to collect data on entrepreneurial motivation between July 1st 2012 and September 15th 2012.

To distinguish necessity from opportunity entrepreneurs, we asked participants the following question "Overall, did you create your business to seize an opportunity, or by necessity, to create your own job?". 95% of respondents could classify themselves in one of the two categories. This trend is consistent with survey data from GEM (Reynolds et al., 2005). 143 (49%) replied that they had started their business by necessity, to create their own job. We term these respondents necessity entrepreneurs. 134 (46%) declared that they had started a business to seize an opportunity. We term these respondents opportunity entrepreneurs. Finally, 17 (5%) declared both types of motivation. We exclude these 5% of respondents from our analysis, since their motivations are not clearly differentiated. Unsurprisingly, the proportion of necessity entrepreneurs among the respondents in our data set is considerably larger than in existing studies. As mentioned before, this bias toward necessity entrepreneurship in our data set is useful for comparison, and is explained by the context of microfinance in France. The microcredit is viewed here as a tool for public policy encouraging self-employment, especially for unemployed individuals.

Finally, the data on business cycles was collected from the French National Institute of Statistics and Economic Studies (INSEE). We provide the descriptive statistics of all the variables used in the analysis in Table 1.

[Insert Table 1 here]

3.2 Dependent variables

The dependent variables in our analysis represent different measures of entrepreneurial success. In our baseline model, we use two main measures of performance.[7] The first dependent variable, *Repaying*, is a dummy taking value one if a client has strictly less than three late payments in his or her credit history as of January 2016. These late payments can be either outstanding or repaid at the time of analysis. This definition is close to that used by the MFI for written-off loans, corresponding to loans with three or more consecutive late payments. We do not focus exclusively on consecutive late payments, since it is not our aim to capture exclusively written-off loans. Our aim is to capture

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[6]The 3-year survival rate for businesses created in 2010 in PACA region. Source: the French National Institute of Statistics and Economic Studies website, accessed on June 14, 2016.

[7]Note that both measures of performance are consistent with the measure of success used in our theoretical reasoning.

problematic borrowers, who have difficulty paying their debts. 57% of our sample had less than three late payments in their credit history at the time of the analysis. The second performance measure is the dummy variable *Closed*, taking value one if the business is closed as of March 2016. 43% of businesses in our sample closed during the observation period.

3.3 Explanatory variables

The main explanatory variable is the *Necessity* dummy (see Table 1 for definition). As expected, more than 50% of our sample identify themselves as necessity entrepreneurs. The second most important variable, which we use as an instrument (see next section), is *Avoid_unemployment*. It is a dummy variable taking value one if respondents answered "To avoid unemployment" to the question "What was your main reason for business start-up?", multiple answers being possible. Other possible answers to this question include: to accomplish a life project or dream, to increase personal revenue, to have more independence, to benefit from subsidies for business start-up, or other. Interestingly, only 32% of respondents answered *Avoid_unemployment* to this question, meaning that not all necessity entrepreneurs take up self-employment in order to avoid unemployment.

Other control variables include age, gender, education level, household income, a dummy variable for long-term unemployment, size of the project, having other debts, start-up, trade sector and limited liability company dummies. Most of the respondents are start-ups. This is consistent with Shahriar et al. (2016) who argue that not-for-profit MFIs are more likely to finance business start-ups compared to their for-profit counterparts.

According to Millán et al. (2012), the inclusion of "macroeconomic sources of variance" considerably improves the quality of outcomes attributable to individual effects. Hence, we additionally control for quarterly rates of increase in business failures (as a measure of economic health) and in new business start-ups (as a measure of competition) at the time the loan is granted (as well as one and two quarters later) for each micro-enterprise in our sample, according to its sector of activity. Data for business cycles exclusively cover the French PACA Region, the region where the MFI providing data operates (Source: INSEE).

See Table 1 for the definitions of all the variables used in our empirical analysis. Finally, to explore the differences between opportunity and necessity entrepreneurs, we present the results of a simple probit regression in Table 2, where the dependent variable is the dummy *Necessity*. We find that necessity entrepreneurs are more likely to take up self-employment in order to avoid unemployment, tend to be older and come from poorer households. These findings are in line with Block and Sandner (2009). We also reveal that necessity entrepreneurs are less likely to set up limited liability companies, meaning that they are more likely to set up sole proprietorships.

[Insert Table 2 here]

4 Model estimation and results

In this paper, we are interested in the effect of entrepreneurial motivation on repayment performance and business survival. As explained in the previous section, the main explanatory variable here is *Necessity*. However, this variable can be endogenously determined. For instance, *ex-ante* necessity entrepreneurs can shift to opportunity status over time. Jayawarna et al. (2013) argue that entrepreneurial motivation are not static and are influenced by career, household and business life. In our case, this dynamic aspect of motivation is particularly important, since we do not observe

motivation at the time of business start-up. Instead, we observe entrepreneurial motivation at the time of the survey, which corresponds to different stages in the life of the businesses, ranging from start-ups to well-established firms. Econometrically, the unobserved changes in individual life-courses correspond to the problem of omitted variables. To deal with this caveat, we use a bivariate probit model appropriate to binary endogenous variables (see Wooldridge, 2010, pp. 594–599).[8] Using a simple probit equation which does not account for the endogeneity of the *Necessity* dummy would lead to inconclusive results (Block et al., 2011). The instrument we use to correct for the endogeneity of the *Necessity* variable is the dummy variable *Avoid_unemployment*. This variable does not have the dynamic nature highlighted by Jayawarna et al. (2013).

Our bivariate probit model writes as follows:

$$y = \mathbb{1}[\alpha Necessity + \boldsymbol{z_1}\boldsymbol{\beta_1} + e_1] \tag{1}$$

$$Necessity = \mathbb{1}[\boldsymbol{z}\boldsymbol{\beta_2} + e_2] \tag{2}$$

where (e_1, e_2) are independent of $\boldsymbol{z}$ and distributed as bivariate normal with mean zero, unit variance, and $\rho = Corr(e_1, e_2)$. If $\rho \neq 0$ then estimating equation (1) using a simple probit model would not lead to consistent estimators of parameters α and $\boldsymbol{\beta_1}$. We will use the LR test to test the null hypothesis $\rho = 0$. This is appropriate to test for exogeneity of binary variables, as suggested by Wooldridge (2010). Variable y is the dependent variable, representing the performance of the entrepreneur. As mentioned before, we use two measures of entrepreneurial performance, the first being the dummy variable *Repaying* and the second being the dummy variable *Closed*.

The vector $\boldsymbol{z_1}$ includes the constant term and all the explanatory variables defined in Table 1, except the variable *Avoid_unemployment*. The latter is used as an instrument in our model and is only included in vector $\boldsymbol{z}$, which also includes vector $\boldsymbol{z_1}$.

We present the results of the estimation of the bivariate probit model in Table 3. Columns (1) and (2) report the results for loan repayment estimations and columns (3) and (4) report the results for business survival. Business cycles are included in columns (2) and (4).

In terms of loan repayment, we find a negative effect of necessity motivation on the likelihood of having less than 3 late payments. This result suggests that necessity entrepreneurs are significantly more likely to have difficulty with loan repayment. While our paper is innovative in exploiting the relationship between entrepreneurial motivation and loan repayment, this result corroborates previous studies finding that necessity entrepreneurs undertake less profitable projects (Block and Wagner, 2010) or are unwilling to grow (Jaouen and Lasch, 2015). This result is also in line with Andersson and Wadensjo (2007), who find that initially unemployed or inactive entrepreneurs earn lower incomes than entrepreneurs who were initially wage-earners.

In terms of business survival, we find a non-significant effect of necessity motivation on business survival. This result is in line with Block and Sandner (2009). While opportunity entrepreneurs perform better, enjoying greater intrinsic benefits from running a business, this positive effect on effort is counterbalanced by greater external opportunities. These opportunities may lead to them closing their business despite better financial performance. The coexistence of these two effects may explain the non-significant effect of entrepreneurial motivation on business survival.

[Insert Table 3 here]

Concerning the control variables, we note that loan repayment and business survival are not impacted by exactly the same set of determinants. We find that older borrowers are more likely to successfully

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[8]Mimicking a two-step procedure would not lead to consistent parameter estimations, according to Wooldridge (2010).

manage their loan repayment and less likely to quit self-employment. The latter result is supported by existing studies.[9]

We find a negative relationship between the male dummy and successful loan repayment, although this result is significant at 10% level in the specification without business cycles alone. This finding is standard in the microfinance literature (see D'Espallier et al., 2011, for instance). However, gender does not significantly impact business survival, and the literature does not reach consensus on the relationship between gender and business survival. Our insignificant effect is in line with Oberschachtsiek (2012), while others find a negative impact of the male dummy on business closure (see Millán et al., 2012).

We find a non-significant effect of education on loan repayment. In contrast, there is a significantly negative relationship between education and business closure. This is in line with Millán et al. (2012) and Bates (1990). The latter study reveals that businesses started by highly educated owners are more likely to be viable and long-lasting than those started by less educated owners.

We find no significant relationship between household income and loan repayment and business survival. The literature mainly supports a positive relationship between initial wealth and business survival, although insignificant results are also reported.

We find that the size of the project has no significant impact, in contrast to Oberschachtsiek (2012). However, that author uses a dummy variable to distinguish between businesses larger than EUR 25,000, whereas we use a continuous variable.

Interestingly, having other debts from financing institutions improves loan repayment performance and business survival. It is important to mention that the MFI will only disburse funds if all other co-financing parties agree to finance the client. Therefore, the effect is probably due to the screening complementarities between the MFI and other financing institutions, which can be commercial banks or other public partners (Cozarenco and Szafarz, 2016).

Although positive, the start-up dummy is not significant in the business survival equations, in contrast to Bates (1990), who argues that start-ups are less likely to survive compared to takeovers. Conversely, Oberschachtsiek (2012) finds that the takeover dummy has no effect on business closure. However, our data set contains a large proportion of start-up businesses, which are also the main target of the microcredit.

The trade sector dummy has a negative impact on business survival and no impact on loan repayment. The limited liability company dummy has no impact in either equation. Results on business cycles are available from the authors upon request.

Finally, ρ corresponding to the correlation between the error terms in equations (1) and (2) is only significant for loan repayment estimation. We conclude that using a bivariate probit model where the *Necessity* dummy is endogenous is appropriate for loan repayment, as opposed to a simple probit equation.[10]

Overall, we conclude that our findings are in line with the existing literature and the mechanism highlighted in the stylized model. Necessity entrepreneurs have significantly more difficulty repaying their loans, corroborating previous studies reporting smaller and less profitable projects. However, their businesses are just as likely to survive, because opportunity entrepreneurs tend to seize better external opportunities, despite higher intrinsic benefits from running a business.

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[9]In many cases, a non-linear relationship between age and performance is tested. We added a quadratic term for age in the model. We detect a non-linear effect in the loan repayment equation, where beyond a threshold, the positive effect of age becomes negative. However, no such effect is found in the survival equation. These results are available from the authors upon request.

[10]A simple probit model for the business survival dummy produces similar results.

5 Robustness checks

As the literature on credit scoring models (Roszbach, 2004) indicates, it is not just credit default itself that is important, but *when* the default occurs. An early default is more costly for the bank than a default occurring towards the end of the loan period. The survival time of businesses too is now commonly analyzed in the literature on entrepreneurship (Oberschachtsiek, 2012). Therefore, to check for the robustness of our results we perform a duration analysis on loan repayment and business survival. However, in this alternative approach we are no longer able to deal with the endogeneity of the *Necessity* dummy, since instrumental variable methods are not advanced enough for regression analysis of survival time with censoring (Tchetgen Tchetgen et al., 2015).

To get around this, we adopt an alternative approach using a different definition of necessity entrepreneurs. Instead of using the variable *Necessity*, we directly include the variable *Avoid_unemployment* to proxy entrepreneurial motivation. This alternative variable identifies respondents with push motives, who become self-employed to avoid unemployment. The main advantage of this approach is that it is relatively objective compared to the previous measure. Furthermore, this variable is less likely to be plagued with endogeneity. Finally, the number of observations used increases from 276 to 293 due to this change in the definition of entrepreneurial motivation.

5.1 Estimation of survival time

In Fig. 1, we give the survivor function $S(t)$ and the hazard function $h(t)$, where t represents the time before the third late payment in the upper panel and the time before business closure in the lower panel. For censored observations (borrowers with strictly less than three late payments in their credit history and operating businesses), t is the observation period. The survivor function is the probability of surviving beyond time t and the hazard function is the probability of the failure event occurring within a given time interval, provided that the subject has survived until the beginning of that interval, divided by the width of the interval (Cleves et al., 2010).

We tested for equality of the survivor functions across necessity and opportunity entrepreneurs using a log-rank test (see Cleves et al., 2010, pp. 122–124 for more details). We find a significant (at 10%) difference between the survivor functions for time before three late payments in the credit history according to borrower motivation. However, no significant difference is detected for business survival time.

[Insert Figure 1 here]

We use parametric duration models in accelerated failure-time (AFT) metric.[11] Business survival analysis is close to Oberschachtsiek (2012), who also uses parametric AFT models for exits from self-employment for initially unemployed individuals. In such models, a parametric distribution is assumed for the expected duration τ_i, which is a function of the survival time t_i and a vector of explanatory variables $\boldsymbol{x}$, which includes the *Avoid_unemployment* dummy, our main variable of interest:

$$\tau_i = exp(-\boldsymbol{x_i}\boldsymbol{\beta})t_i \tag{3}$$

Therefore, the estimated models take the following form:

$$ln(t_i) = \boldsymbol{x_i}\boldsymbol{\beta} + ln(\tau_i) \tag{4}$$

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[11]We additionally use the Cox proportional hazards model (Cox, 1992), which is a semi-parametric model, since the proportionality assumption cannot be rejected in our data (Schoenfeld, 1981). This model yields similar results. They are available from the authors upon request.

where $ln(\tau_i)$ has a distribution determined by what is assumed about the distribution of τ_i (Cleves et al., 2010) and vector $\boldsymbol{\beta}$ contains the parameters to be estimated. We tested different specifications for the distribution of τ_i (exponential, Weibull, lognormal and log-logistic). According to the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC), the best distribution according to the underlying data is the lognormal distribution where:

$$\tau_i \sim lognormal(\beta_0, \sigma)$$

One salient feature of the lognormal distribution is that the hazard function is non-monotonic in time. It is first increasing and then decreasing. This feature is particularly relevant for our data, as illustrated in Fig. 1, for the hazard rate function, which seems to follow a non-monotonic pattern. Nevertheless, we additionally report the results for Weibull distribution ($\tau_i \sim Weibull(\beta_0, p)$), since it allows for a monotonic hazard function, which also seems to be supported by the hazard function for necessity entrepreneurs in terms of business survival (see Fig. 1 the lower right graph).

The parameters β presented in Table 4 illustrate the relationship between the explanatory variable and the survival time: a positive coefficient means that the higher the explanatory variable, the longer before a third late repayment (columns (1) and (2)) or business closure (columns (3) and (4)). Alternatively, the results can be interpreted in terms of time ratios, so that for an explanatory variable x_j, $exp(\beta_j)$ is the factor by which the expected time-to-failure is multiplied as a result of a one-unit increase in x_j (see Cleves et al., 2010, pp. 240–241 for more details).

5.2 Results

In terms of duration models, we find that respondents who gave a *Avoid_unemployment* reason for business start-up have a 0.74-times shorter expected time before third late payment ($\beta = -0.3$, $exp(\beta) = 0.74$) than those who did not give this reason. However, length of business survival is not significantly different across the two groups. This latter result challenges Oberschachtsiek (2012)'s finding of a positive relationship between "pull" motivation (corresponding to opportunity entrepreneurs) and business survival. Overall, the results for the duration model corroborate our previous findings using bivariate probit models. Necessity entrepreneurs seem to experience significantly more difficulties with loan repayment, and these difficulties arise earlier. Yet, they do not seem to close their businesses more often or earlier than opportunity entrepreneurs.

A few results concerning other controls are worth mentioning. One difference from Table 3 consists in the significant coefficient for household income in the lognormal specification for late repayment, suggesting that a larger household income increases the time before third late repayment.

Long-term unemployment is associated with a shorter time to business closure, whereas other debts have no significant impact, in contrast to the results in Table 3. Interestingly, the start-up dummy is negatively associated with time to business closure in the lognormal specification, whereas it has no significant effect on the probability of business closure in Table 3.

Finally, we note that the Weibull shape parameter is significant at 1% level, with ln(p)>0, meaning that $p > 1$ and the Weibull hazard is monotone increasing in time. σ, which is the lognormal distribution parameter, is also significantly different from zero at 5% level, suggesting the presence of a non-monotonic hazard function.

[Insert Table 4 here]

6 Conclusion

This article analyzes the link between entrepreneurial motivation and business performance. Our contribution to the extant literature is twofold. First, we analyze entrepreneurial motivation in a particular context: French microfinance. We find that, in our sample, almost 52% of micro-entrepreneurs are necessity entrepreneurs. This feature of our data set makes the analysis of entrepreneurial motivation particularly relevant, since we have a relatively heterogeneous data set compared to previous studies (Block and Sandner, 2009). Such heterogeneity is not surprising, given that microfinance in Europe is a policy tool encouraging self-employment as a way out of unemployment (Bendig et al., 2012). In line with this definition, target microfinance clients are expected to be necessity entrepreneurs. That said, microfinance also plays a more general role, serving the rejected applicants of mainstream banks. Start-ups whose founders have limited personal asset to invest are typically rejected by the mainstream financial market due to lack of credit history or of sufficient levels of collateral. Therefore, rejected opportunity micro-entrepreneurs are just as likely to apply for a microcredit. Importantly, Duflo (2010) argues that differentiating between entrepreneurial motivation is one of the major challenges for the microfinance sector.

Second, using a hand-collected data set from a French MFI, containing detailed individual information on credit history, we exploit a novel indirect measure of business performance, namely loan repayment. Its advantage over previous performance measures such as employment and turnover growth relies on the argument that not all entrepreneurs wish to grow (Jaouen and Lasch, 2015). Following this argument, we interpret difficulty in loan repayment as an indirect way to measure poor business performance, getting around the limitation of voluntary unwillingness to grow. We find that necessity entrepreneurs have significantly more difficulty repaying their loans.

In parallel, we perform a business survival analysis, which is particularly relevant since there is still no consensus on the relationship between entrepreneurial motivation and business survival. Our paper finds a non-significant relationship between necessity motivation and business survival, challenging the recent finding by Oberschachtsiek (2012) of a negative relationship. Our stylized theoretical model, where opportunity entrepreneurs enjoy both higher external opportunities and larger non-pecuniary benefits from creating a business, provides formal arguments supporting this non-significant relationship.

In terms of policy implications, the literature suggests that having received a start-up subsidy decreases the risk of exiting self-employment (Millán et al., 2012). In France, the microfinance sector benefits from strong government support in the form of direct or indirect subsidies (Bendig et al., 2014). Our paper shows that necessity entrepreneurs are just as likely as opportunity entrepreneurs to stay in business. From this perspective, the microfinance sector, where necessity micro-entrepreneurs are overrepresented, is worth subsidizing. However, our results additionally show that necessity entrepreneurs have significantly more difficulty repaying their loans. Despite equal chances of surviving, necessity micro-entrepreneurs struggle to face their financial commitments, most likely due to the limited growth potential of their businesses (Jaouen and Lasch, 2015). The regulator should be aware of this caveat when designing programs targeting necessity entrepreneurs. One way of tackling this problem is by subsidizing business development services (Bourlès and Cozarenco, 2014).

Owners of businesses that close might continue to be self-employed in some other firm or become paid employees, unemployed or inactive (Millán et al., 2012). Using a competing risk model, we could identify any potential difference in exit state between opportunity and necessity entrepreneurs. One of the limitations of our data set is the fact that we do not observe the exit state when there is business closure. If necessity entrepreneurs are just as likely as opportunity entrepreneurs to switch to

paid employment, subsidizing business start-ups through microfinance makes perfect sense. Further research would be useful to explore whether professional experience (human capital) acquired through self-employment or the business development services provided by most European MFIs can lead to a stable wage-earning position in the future.

Another limitation is that we observe entrepreneurial motivation at the time of the survey, which coincides with different stages in the respondents' business life-cycle. This is problematic, since entrepreneurs are subject to dynamic motivations (Jayawarna et al., 2013). To get around this, we use an alternative measure of entrepreneurial motivation in the robustness checks. A more rigorous way to deal with this limitation would be to administer the survey at the time of loan application. This procedure would also help control for selection bias (Heckman, 1979) by using data on rejected applicants from the MFI.

Finally, survival models using the instrumental variables technique could be implemented to control for the endogeneity of entrepreneurial motivation. One step in this direction is provided by Tchetgen Tchetgen et al. (2015). However, the technique is still in development phase and would need adapting.

Appendix

A stylized model linking entrepreneurial motivation and business performance

To analyze the theoretical link between entrepreneurial motivation and business performance, we adapt the canonical model of Tirole (2006) to account for features specific to the microcredit and differences between opportunity and necessity entrepreneurship. We assume that (i) entrepreneurs own no collateral and apply for full financing of their project, (ii) the MFI offers a fixed interest rate regardless of the borrower's type[12] and (iii) entrepreneurs differ with respect to their external opportunity and their intrinsic motivation.

Entrepreneurs. Formally, we consider entrepreneurs who need one unit of financing to run their planned business. Depending on effort and luck, this business can either succeed, giving a monetary return R, or fail, giving a 0-return. The probability of success $p(e)$ is partly governed by the effort $e \in \mathbb{R}^+$ that is provided by the entrepreneur (with $p'(\cdot) > 0$ and $p''(\cdot) < 0$). We assume that this effort is costly and represent its cost by an increasing and convex function $\psi(e)$. In the event of success, on top of the monetary return, the entrepreneur receives a non-pecuniary benefit b. To disentangle monetary and non-monetary benefits, we assume that entrepreneurs derive a concave utility from the monetary component, through the utility function $u(\cdot)$, with $u(\cdot)' > 0$ and $u(\cdot)'' < 0$.[13] Conversely, in the event of failure, the entrepreneur must turn to her external opportunity, which provides her with a wage o.

The MFI. As noted above – the entrepreneur neither making a personal investment nor having collateral, and in line with microfinance practices in developed countries – the MFI that lends the monetary unit gets the (fixed) interest rate r in the event of success and nothing in the event of failure.

The aim of this stylized model is to understand how the non-pecuniary benefit (intrinsic motivation) b and the external opportunity o influence borrowers' effort e and consequently their business survival.

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[12] This is consistent with data used in the empirical part of the paper, in which the MFI fixes the same interest rate for all borrowers, also common practice for MFIs worldwide.

[13] Note that our result still holds with risk-neutral agents, as in Tirole (2006).

Under this setting, an entrepreneur with intrinsic motivation b_i and external opportunity o_i chooses the level of effort e_i^* that maximizes her expected utility:

$$\mathbb{E}\left[u(b_i, o_i)\right] = p(e_i)\left[u(R - r) + b_i\right] + (1 - p)u(o_i) - \psi(e_i)$$

Her optimal effort therefore solves:

$$f(e_i^*, o_i, b_i) = p'(e_i^*)\left[u(R - r) + b_i - u(o_i)\right] - \psi'(e_i^*) = 0$$

provided that $u(R - r) + b_i > u(o_i)$ (otherwise, the optimal effort is nil, as the entrepreneur is better off failing).

This allows us to analyze how the optimal effort (and therefore the probability of success) varies with the intrinsic motivation b_i and the external opportunity o_i using partial derivatives of $f(\cdot)$.

Due to our assumptions on $p(\cdot)$, $\psi(\cdot)$ and $u(\cdot)$, we have $\frac{\partial f}{\partial e_i^*}(\cdot) < 0$, $\frac{\partial f}{\partial o_i}(\cdot) < 0$ and $\frac{\partial f}{\partial b_i}(\cdot) > 0$. Therefore, the next proposition holds:

Proposition 1 *The effort chosen by an entrepreneur and the subsequent probability of success is increasing in her intrinsic motivation $\left(\frac{\partial e_i^*}{\partial b_i} > 0\right)$ and decreasing in her external opportunity $\left(\frac{\partial e_i^*}{\partial o_i} < 0\right)$.*

. Thus, the effect of entrepreneurial motivation on business performance appears to be ambiguous when opportunity entrepreneurship is understood as involving both higher intrinsic motivation and greater external opportunity.

14

Tables and Figures

Table 1: Variable definitions and descriptive statistics

Variable	Description	Mean	SD
Dependent variables:			
Repaying	1 if the loan has strictly less than three late payments in the credit history at the time of the analysis.	0.568	0.496
Closed	1 if the business is closed at the time of the analysis.	0.425	0.495
Explanatory Variables:			
	Individual Characteristics:		
Necessity	1 if the respondent answered "by necessity, to create my own job" to the question "Overall, did you create your business to seize an opportunity or by necessity, to create your own job?"	0.516	0.501
Avoid unemployment	1 if the respondent answered "To avoid unemployment" to the question "What was your main reason for business start-up?" (multiple answers were possible).	0.316	0.466
Age	The age of the respondent in years.	37.806	9.381
Male	1 if the respondent is male.	0.605	0.490
Education	Number of educational qualifications.	1.816	1.009
HH Income	Household income at the time of credit application in kEUR.	1.689	1.161
Unemployed more 6	1 if the respondent was unemployed for more than 6 months at the time of loan application.	0.575	0.495
	Business Characteristics:		
Project size	Project size in kEUR.	33.931	38.857
Other debts	1 if the applicant has debts to other financing institutions.	0.619	0.486
Start-up	1 if the business is a start-up.	0.816	0.388
Trade	1 if the business is in the trade sector.	0.299	0.459
LLC	1 if the business is a limited liability company.	0.503	0.501
	Business Cycles:		
Failures0	Rate of increase in business failures at the time the loan is granted.	0.019	0.211
Failures1	Rate of increase in business failures one quarter after the loan is granted.	0.036	0.252
Failures2	Rate of increase in business failures two quarters after the loan is granted.	-0.003	0.208
Newstartup0	Rate of increase in new business start-ups at the time the loan is granted.	0.034	0.321
Newstartup1	Rate of increase in new business start-ups one quarter after the loan is granted.	0.023	0.236
Newstartup2	Rate of increase in new business start-ups two quarters after the loan is granted.	0.027	0.259

SD: standard deviation

Table 2: Determinants of entrepreneurial motivation

	Dependent variable: Necessity dummy	
Explanatory variables:		
Avoid unemployment	1.53***	(0.21)
Age	0.02*	(0.01)
Male	0.14	(0.19)
Education	-0.03	(0.09)
HH income	-0.19**	(0.08)
Unemployed more 6	-0.13	(0.19)
Project size	-0.00	(0.00)
Other debts	-0.14	(0.18)
Start-up	-0.02	(0.24)
Trade	0.26	(0.21)
LLC	-0.64***	(0.20)
Constant	-0.28	(0.50)
Observations	276	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Determinants of Entrepreneurial Performance

	Dependent variable:			
	Repaying		Closed	
	(1)	(2)	(3)	(4)
Explanatory variables:				
Necessity	-0.95***	-0.98***	0.05	-0.04
	(0.31)	(0.33)	(0.35)	(0.36)
Age	0.02**	0.02**	-0.02**	-0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
Male	-0.27*	-0.23	-0.25	-0.25
	(0.16)	(0.17)	(0.17)	(0.18)
Education	0.04	0.07	-0.21**	-0.21**
	(0.08)	(0.09)	(0.09)	(0.09)
HH income	0.01	0.02	0.02	0.03
	(0.07)	(0.07)	(0.08)	(0.08)
Unemployed more 6	-0.01	0.03	0.15	0.16
	(0.16)	(0.16)	(0.17)	(0.17)
Project size	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Other debts	0.24	0.35**	-0.43***	-0.33*
	(0.16)	(0.17)	(0.16)	(0.17)
Start-up	-0.09	-0.14	0.25	0.25
	(0.21)	(0.21)	(0.22)	(0.23)
Trade	0.09	0.12	0.32*	0.34*
	(0.17)	(0.18)	(0.18)	(0.18)
LLC	-0.11	-0.12	-0.02	-0.03
	(0.19)	(0.20)	(0.20)	(0.20)
Constant	0.11	-0.19	1.08**	0.91*
	(0.47)	(0.49)	(0.51)	(0.51)
ρ	0.76**	0.75**	0.11	0.15
	(0.35)	(0.37)	(0.23)	(0.23)
Business Cycles	No	Yes	No	Yes
Observations	276	276	276	276

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Alternative Measure of Entrepreneurial Motivation: Duration Models

Estimation method:	Parametric duration models			
Dependent variables:	Time to 3rd late payment		Time to business closure	
	Weibull	Lognormal	Weibull	Lognormal
	(1)	(2)	(3)	(4)
Explanatory variables:				
Avoid unemployment	-0.34**	-0.30*	0.08	0.04
	(0.17)	(0.18)	(0.14)	(0.14)
Age	0.02*	0.01	0.02***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
Male	-0.26	-0.31*	0.16	0.21
	(0.17)	(0.18)	(0.13)	(0.13)
Education	0.08	0.13	0.13*	0.12*
	(0.08)	(0.09)	(0.07)	(0.07)
HH income	0.00	0.00*	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Unemployed more 6	0.02	-0.03	-0.28**	-0.23*
	(0.16)	(0.18)	(0.13)	(0.13)
Project size	-0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Other debts	0.42***	0.40**	0.10	0.18
	(0.16)	(0.18)	(0.13)	(0.13)
Start-up	-0.27	-0.24	-0.21	-0.35**
	(0.22)	(0.23)	(0.17)	(0.17)
Trade	-0.03	-0.06	-0.41***	-0.45***
	(0.17)	(0.19)	(0.13)	(0.14)
LLC	0.02	0.07	-0.03	0.05
	(0.18)	(0.19)	(0.14)	(0.14)
ln(p)	0.21***		0.44***	
	(0.08)		(0.07)	
ln(σ)		0.17**		-0.14**
		(0.07)		(0.07)
Constant	7.00***	6.71***	7.35***	7.19***
	(0.45)	(0.48)	(0.35)	(0.37)
Business Cycles	Yes	Yes	Yes	Yes
Observations	293	293	293	293
Nb. of failures	126	126	124	124

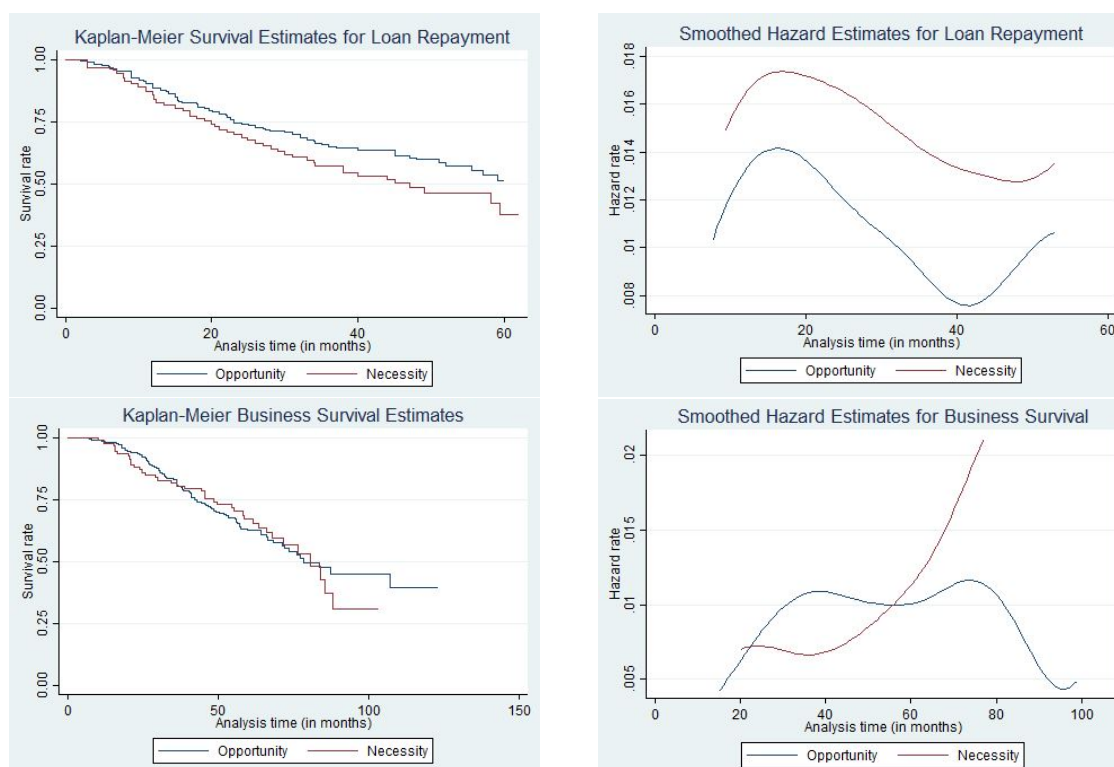Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

17

Figure 1: Survivor and hazard functions

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