



The impact of the formal employment contract on credit access in Africa

Samuel Monteiro

► To cite this version:

Samuel Monteiro. The impact of the formal employment contract on credit access in Africa. 2020. hal-02493388

HAL Id: hal-02493388

<https://hal.science/hal-02493388v1>

Preprint submitted on 27 Feb 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

The impact of the formal employment contract on credit access in Africa

SAMUEL MONTEIRO



SAMUEL MONTEIRO, Environnement Social Gouvernance and Impact Manager, Investisseurs & Partenaires. s.monteiro@ietp.com

Abstract

Utilizing a new database of over 200 employees surveyed in Senegal, we demonstrate the impact of formalization and employment contracts on credit access. Through a probit model, we show that formalization has a significantly positive impact on credit access since an employee's probability of accessing credit increases by 23% if they have a formal employment contract. The possession of an employment contract increases the likelihood of having a bank account by 18%. We find that other potential determinants studied in the existing literature, such as gender, education and salary, do not have a significant impact on access to credit. These results highlight the impact of formalization on credit access and make a strong case for the economic development that could result from a continuation of the efforts being undertaken to formalize African economies, which still remain predominantly informal.

Key words: Credit access; formal job; employment; banking; Africa.

JEL Classification: D12, O12, O55, G2.

1. Introduction

In the context of the Sustainable Development Goals and the fight against poverty, access to credit is often cited as an effective tool for development (SDG 1.4; World Savings Bank Institute, 2010). The underlying rationale of this is that providing credit, to those in poverty would help them rise above poverty and mitigate shocks, invest, acquire productive assets, increase their skills, open a business, etc.

Given these significant financial and non-financial potential impacts, a better understanding of the determinants that influence access to credit is a necessary prerequisite to facilitating poverty alleviation for the greatest number of people. Our study explores the role job formalization plays in access to credit. Through a survey of 200 Senegalese employees of 6 companies, we show that having a formal employment contract increases the probability of obtaining bank loan by 23%. In addition, we seek to understand how the employment contract promotes access to credit. We find that the relationship is largely explained by the banking relationships induced by formalization. Indeed, twice as many formal employees (82%) have a bank account as do informal employees (43%), mainly because of the more frequent use by formal employers of bank transfers to pay wages. The possession of a bank account influences both the supply of and demand for loan since it allows employees to familiarize themselves with the financial services offered by banks on the one hand and, on the other hand, provides banks with a banking relationship and history that reduces information asymmetry and facilitates the extension of credit.

The contributions of our study are numerous. The existing literature has focused mainly on developed countries, as shown by studies by Crook (2001) in the United States, Magri *et al.* (2011) in Italy and Worthington (2005) in Australia. However, the barriers to credit access in Africa, disproportionately high compared to other continents, deserve special attention. While some studies have focused on access to credit in Africa, they have mainly focused on the analysis of credit rationing at the firm level (Bigsten *et al.*, 2003; Fafchamps, 2000) due to the difficulty of accessing household data. Some authors have tried to focus on households but have only looked at small farmers in rural areas (Akpan, 2013; Akudugu, 2012). Our paper contributes to the existing literature by studying both the case of an African country, namely Senegal, as well as an original target population, namely employees of small businesses. This novel sample is made possible by the creation of a new database built from surveys of more than 200 employees of small businesses.

Our study provides an in-depth look at one determinant of access to credit that has been neglected in the literature, namely the role of formalization and the employment contract. Some existing studies have focused on small-scale agricultural producers who are self-employed. The determinants of access

to credit mentioned in the literature focus primarily on gender, education level, salary or household composition. Existing household surveys are primarily made up of informal employees which reflect the structure of African economies that are still overwhelmingly/mostly informal. It is therefore very difficult to study employees and develop an argument on the impacts of having a formal employment contract.

This paper is organized as follows. Section 2 presents a review of the existing literature. Section 3 describes the data and methodology. Section 4 displays the results, showing the importance the role of formalization and the employment contract play in credit access. Section 5 presents robustness checks. The final section concludes.

2. Literature review

The economic literature has largely shown the positive impacts of credit on many aspects of people's lives, as summarized by Van Rooyen et al. (2012) in their review of the existing literature on the impacts of credit in Sub-Saharan Africa. To begin with, bank credit significantly improves individual incomes (Barnes *et al.*, 2001; Gubert and Roubaud, 2005). Credit can be used to invest and acquire productive assets that promote income growth. However, credit has impacts beyond the financial. It can also make it easier to adapt to different types of shocks (such as disease, famine, unemployment, etc.) and improve socio-economic conditions. Access to financing can also have a positive impact on non-financial outcomes such as individual health (Lacalle Calderon *et al.*, 2008; Brannen, 2010), household nutrition (Barnes *et al.*, 2001; Brannen, 2010), children's education (Adjei *et al.*, 2009) and housing comfort (Lacalle Calderon *et al.*, 2008). As Seefeldt (2015) summarizes, access to credit can "increase consumption beyond what one's income can support, it can smooth consumption during periods when income falls, and it can represent an investment in the future". The economic emancipation made possible by credit is nevertheless put into perspective by some studies that point out that the poorest individuals are often not reached (Zaman, 2001).

While it is relatively widely accepted that financial services have a positive impact on poverty reduction and economic development, widespread access has not been achieved. Many individuals face financing constraints and are unable to access credit. This is why a body of literature has developed on the determinants of credit access to attempt to better understand the factors that influence the availability of credit. This literature has examined many household characteristics, such as education level, which would have a significantly positive impact on access to credit (Okurut, 2006; Vaessen, 2001; Kedir, 2003) as well as marital status since a couple often has a second source of income (Baffoe and Matsuda, 2015). However, other determinants, such as gender, have not always been found to improve credit access. Some studies have shown that women have less access to credit than men

(Lawal and Muiyiwa, 2009; Foltz *et al.*, 2000) while other studies have not found significant impacts (D'Espallier and Guérin, 2009). The same is true for the determinant of age, which according to some studies has a positive impact on credit access (Jia *et al.*, 2010; Barslund *et al.*, 2008) but in others has been found to be not significant (Baiyegunhi *et al.*, 2010; Chaudhuri *et al.*, 2011).

Few studies have looked at employment as a significant determinant of access to credit. As studies are based primarily on rural farm households, data on the impact of employment and particularly formal employment, are rarely available. The study closest to our work is that of Biyase and Fisher (2017), who focus on the determinants of access to credit for poor households in South Africa. They show that employment has a significantly positive impact on credit access. However, they do not distinguish the type of employment nor do they specifically focus on the impact of formalization and the employment contract. Our work thus allows us to deepen these explorations.

3. Data and Methodology

3.1. Data

The survey we administered in Senegal was embedded in a study carried out between August and September 2018. It was designed to assess the impacts of employment contracts in an attempt to better understand the benefits of formalization and why some people might prefer to work in the formal sector while others may not. To explore this question, our survey consisted of two parts: (i) background questions on socio-economic characteristics such as age, education, marital status and; and (ii) questions regarding formalization, such as employment contract status and the perceived benefits of this contract, including a module that focused on credit access.

We surveyed 204 employees in Senegal, within 6 partner companies of *Investisseurs & Partenaires* (I&P), a family of impact investment funds that operates exclusively in Africa. As an impact investor, I&P strives to maximize the economic, social and environmental impacts of its partners and to actively contribute to sustainable African development. Our partnership with I&P provided access to its investee companies and allowed us to directly survey their employees. In a country where informality is standard, it is quite rare to have access to employees of formal companies and to get a glimpse of how they view formal jobs.

Senegal was chosen because of the diversity of I&P's partner companies there. Employees worked in several industries, including the agribusiness, health, energy and services sectors, and worked at different hierarchical levels and different types of contracts. This made it possible to obtain a diverse sample covering the many possible situations of employees with and without an employment contract, as well as those considered semi-formal workers with service contracts. In our database, 80% of the

employees surveyed had an employment contract (permanent or temporary) and can be classified as formal workers. The other 20% did not have an employment contract or had a service contract (although in reality a full-time employee of the company). We consider them as informal workers.

For I&P companies, the formalization of employees is an important topic during the investment. All companies are required to achieve full formalization by the end of the investment. This process obviously takes time, several months or even years, hence the fact that there are still formal and informal employees among those we surveyed. Employees generally request formal employment contracts and the choice of who is offered one is most often left to the company. In order to be able to support the increase in social security contributions, companies will often choose to gradually formalize their teams, starting with employees in certain categories. It is not necessarily the executives who are formalized first, but rather key staff who can ensure the smooth running of the production process and who require a significant time investment by the company and where the cost of turnover would be the highest.

To make the transition to formalization, many companies begin by providing intermediate forms of contracts, i.e., service contracts, through the use of third-party service providers. Companies use external service providers to comply with current legislation and to move away from complete informality. These service contracts benefit from a social contribution rate that is twice as low as a traditional employment contract. However, individuals are not directly employed by the company and do not have benefits such as paid leave or health insurance. They are considered as external service providers and are subject to significant precariousness, hence our choice to consider them as informal workers as they do not benefit from any of the advantages of a formal employment contract.

3.2. Credit constrained

To study the impact of formalization on access to credit, it was necessary to define what we meant by credit access. How to define a household as “credit constrained” has been the subject of much discussion in the economic literature. We retain the two main measures most commonly used.

First, based on the work of Jappelli (1990), a household is considered financially constrained if it does not have a bank loan. Our first credit variable is an objective measure of access to credit that is equal to 1 when the employee has a bank loan and 0 otherwise. This is the most directly observable variable for approximating access to credit.

Second, as developed in the survey by Feder *et al.* (1989), we asked participants who did not have a loan the reason(s) for not having borrowed. Indeed, the absence of a loan does not necessarily mean that one is credit constrained but as it may be simply be due to a lack of need. Thus, we consider

employees who responded that they did not have a loan because of a lack of need not to be credit constrained. On the other hand, employees who had not borrowed because they anticipated a refusal or lacked guarantees or collateral are considered to be credit constrained. In other words, if the absence of credit is due to an inability to obtain credit, we classify them as credit constrained. This second measure is more subjective since it is not directly observable and depends on a respondent's perception. It is possible that some respondents may not necessarily be aware of the constraints imposed on them and may feel that they have chosen their credit situation. Conversely, the fact that a person does not need credit does not necessarily imply that she would have obtained it if she had applied for it. Hence, we choose to test the results on these two measures to strengthen the robustness and reliability of our results.

3.3. Methodology

Since our dependent variable takes two possible values (0 or 1), we use a probit model. It is estimated via the maximum likelihood estimator that makes it possible to estimate the probability of observing a sample knowing the model parameters that generated these data. It is a matter of giving a value to the parameters of the model that maximizes the probability of finding our sample. The reading of the results is then different because the estimated coefficient does not directly correspond to the marginal effect and the direct interpretation of the coefficients makes no sense. In the case of binary models, it is then necessary to calculate the marginal effects from the estimated coefficients.

$$\text{Credit}_i = \alpha + \beta_1 \text{Gender}_i + \beta_2 \text{Age}_i + \beta_3 \text{Children}_i + \beta_4 \text{Wage}_i + \beta_5 \text{Education}_i + \beta_6 \text{Married}_i + \beta_7 \text{Householdsize}_i + \beta_8 \text{Employmentcontract}_i + \beta_9 \text{Banking}_i + \varepsilon_i$$

where the credit variable can be defined in two ways, as discussed above. The control variables represent the following characteristics, respectively: being a woman, age, having a child, wage level, education level, being married, household size, having a formal employment contract and finally having a bank account (more details on the definition of the variables are given in Annex 1).

Our interest coefficient is β_8 . A significantly positive marginal coefficient would indicate that the employment contract increases the probability of accessing credit.

4. Results

4.1. Descriptive statistics

An initial statistical analysis compares the different socio-economic characteristics of borrowers and non-borrowers (Table 1). The education level is quite similar in the two categories and does not appear to have a decisive influence on access to credit. Women are less numerous among borrowers (19% vs 35%), which could suggest that they are discriminated against in access to credit. The average salary

of borrowers is also higher than that of non-borrowers. Finally, many more borrowers are married than single.

Borrowers are also more likely to have a formal employment contract. This seems to confirm our initial intuition that formalization makes it easier to access credit. To further explore the link between these determinants and access to credit, we check whether or not our findings are consistent with the econometric results.

Table 1: Employee characteristics

	Mean	Borrowers	Non-Borrowers	t-test
Gender (% female)	28%	19%	35%	2.58**
Age (years)	34	36	32	-3.17***
Children (% with a child)	82%	90%	77%	-2.52***
Wage (CFAF)	155 740	184 233	132 261	-2.73***
Education (% secondary or higher)	73%	71%	75%	0.58
Married (% married)	54%	74%	39%	-5.38***
Household size (nb of people)	9	10	8	-2.96***
Formal employment contract (%)	80%	91%	72%	-3.47***
Bank account (% yes)	74%	94%	59%	-6.34***

Notes: The t-test is used to test the hypothesis that the mean is equal between borrowers and non-borrowers. *, **, *** indicate significance at 10%, 5%, and 1%, respectively.

Through a simple correlation table (Table 2), we find a strong link between our different variables of interest, namely employment contract, bank account and credit. We then empirically test our hypothesis.

Table 2: Correlation table

	Employment contract	Bank account	Credit
Employment contract	1.000		
Bank account	0.355***	1.000	
Credit	0.239***	0.410***	1.000

Notes: *, **, *** indicate significance at 10%, 5%, and 1%, respectively.

4.2. Econometric results

The marginal coefficients presented in Table 3 provide a better understanding of the determinants of access to credit.

Considering our first measure, which takes the value of 1 if the employee has a loan and 0 otherwise (column 1), being a woman does not seem to have a significant impact on access to credit and would indicate that women have the same probability of obtaining credit as men do. Although some studies have shown that women have less access to credit (Lawal and Muiyiwa, 2009; Foltz *et al.*, 2000), our result is in line with other studies that have not found significant impacts (Despallier and Guérin, 2009). Age and education level also do not appear to have a significant impact on access to credit.

The same applies to the wage level, where the variable is significant but the marginal coefficient is close to zero. One possible explanation is that we are looking at access to credit without taking into account the amount borrowed. It is possible that income would more significantly influence the amount borrowed than the probability of obtaining a loan, each person borrowing an amount proportionate to their income. We do not have the amount borrowed and are not able to probe this potential explanation further.

On the other hand, marital status has a significantly positive impact on access to credit. Being married increases the probability of accessing credit by 26%. Indeed, while three-quarters of employees with credit are married, half of those without a loan are single. This result could be explained by a demand effect, that is to say financial needs may be greater when one is married. Another explanation might be that the spouse brings a second source of income and offers a greater guarantee to the bank, thus increasing the probability of obtaining a loan. This second explanation does not appear consistent with our descriptive statistics since almost half of those with credit have an unemployed spouse, compared to only a quarter of those without a loan.

This reasoning is probably similar for household size, which also has a significantly positive impact on credit access. Financing needs may increase with the number of people in the household (demand effect). While the average household size is 7.7 people for non-borrowers a bank loan, household size rises to 10.7 people for borrowers. Yet for employees who have a loan, only 32% of household members work. This percentage rises to 43% of household members who work if we look at non-borrowers' employees. The additional income provided by other household members is more than twice as high for non-borrowers as for borrowers. In other words, people with credit live in larger households with more dependents, which results in greater financial needs and more frequent use of credit.

Formalization has a significantly positive impact on credit access: an employee who has a formal employment contract has a 23% higher probability of accessing credit. It is therefore a powerful explanatory factor that determines credit access. The role of the employment contract is mainly through the bank account channel. Indeed, 82% of formal employees have a bank account, compared to only 43% of informal employees. The higher bank account penetration rate of formal employees is likely linked to the fact that formal employers often set up bank transfers to disperse payroll in order to avoid the use of banknotes and facilitate payroll accounting. Indeed, 70% of formal employees receive their salary via bank transfer compared to only 3% of informal employees. The bank account has a potential advantage both for employees and for banks. Once a formal employee opens a bank account to receive their paychecks, they begin to build a relationship and history with the bank, which is now able to observe the employee's savings and spending patterns. This banking history reduces information asymmetry and makes it easier for banks to assess risk and lend to employees. For employees, a bank relationship can alleviate concerns they may have about a system they may not always understand. A banked employee, by proximity alone, can more easily access information about how the banking system works and is arguably in the position to have more confidence to apply for a bank loan if desired. This reasoning is coherent with the results of our econometric model. Having a bank account increases the probability of accessing bank credit by 37% (column 2). The introduction of the bank account variable makes our formalization variable insignificant. This shows that the impact of the employment contract on access to credit is primarily linked to the higher level of banking generated by formalization. This explanation is the subject of further research in the following section on robustness checks. The results obtained are identical for our second measure of access to credit, which takes into account the reasons why the individual does not have a loan in determining whether or not he is credit constrained (columns 3 and 4).

Table 3: Probit estimation - Baseline regression

	Has a loan		Not credit constrained	
	(1)	(2)	(3)	(4)
Gender	-0.072 (-0.95)	-0.075 (-1.08)	0.004 (0.95)	-0.011 (-0.16)
Age	0.005 (1.38)	0.005 (1.47)	-0.003 (-0.98)	-0.003 (-0.86)
Children	0.053 (0.59)	0.091 (1.10)	-0.032 (-0.39)	0.002 (0.03)
Wage	0.000** (2.33)	0.000 (1.21)	0.000*** (2.75)	0.000** (2.00)
Education	1.04 (1.04)	0.067 (0.92)	0.032 (0.43)	0.018 (0.26)
Married	0.259*** (3.99)	0.201*** (3.18)	0.166*** (2.39)	0.125* (1.89)
Household size	0.014*** (2.68)	0.014** (2.25)	0.009* (1.61)	0.005 (1.13)
Employment contract	0.234*** (2.58)	0.107 (1.19)	0.136* (1.69)	0.031 (0.38)
Bank account		0.369*** (5.00)		0.280*** (4.98)
Obs.	199	199	183	183
Pseudo R ²	0.20	0.28	0.15	0.23

Notes: The dependent variable represents the case in which an employee has a loan (column 1 and 2) and is not credit constrained (columns 3 and 4). Coefficients are marginal effects. Z-statistics are reported in parentheses. *, **, *** indicate significance at 10%, 5%, and 1%, respectively.

5. Robustness checks

One way to test the validity of a probit model is to compare correct predictions to incorrect ones. The contingency table below indicates that the correct response rate is 81%, i.e., our model correctly predicts access to credit for 81% of our sample using the second credit access measure variable that takes into account the reasons for not having a loan (Table 4). This high rate confirms the validity of our estimate and the relevance of the model variables. It should be noted that this correct response rate is also very high (73%) for the first measure of access to credit, which is based on objective observations of whether or not to take out a loan (Appendix 2).

Table 4: Contingency table, not credit constrained

		TRUE	
		Y=1	Y=0
PREDICTED	$\hat{Y}=1$	112	14
	$\hat{Y}=0$	21	36

Notes: The correct answers correspond to the case where the model correctly predicted access to credit, i.e., it correctly predicts that the employee will have a loan ($Y = \hat{Y}=1$) or that the employee will not have a loan ($Y = \hat{Y}=0$). The correct answer rate is the ratio between the number of correct answers predicted and the total number of predictions. In our case, $(112+36) / (112+36+14+21) = 81\%$.

Secondly, one might question whether the main determinant of access to credit is having an employment contract or simply having a bank account. In other words, is the main recommendation of this article to consider that formalization promotes access to credit or is it simply the opening of a bank account that should be promoted? To answer this question, we study in more depth the relationship between an employee's work contract and their bank account to ensure that it is the formalization that triggers the opening of a bank account, which then becomes the channel for accessing credit.

Through a probit model, we show that the employment contract is the main determinant of opening a bank account (Table 5). The employment contract increases the probability of having a bank account by 18%. Indeed, 82% of formal employees have a bank account, compared to only 43% of informal employees. Other potential factors, such as gender, age and level of education, do not have a significant impact on bank account ownership. The wage level is very significant but with a marginal coefficient close to 0. These results seem consistent with our initial intuition. Formalization promotes access to a bank account, which in turn promotes access to credit. The trigger for this positive impact would therefore be to obtain a formal employment contract.

Table 5: Probit estimation - The relationship between employment contract and bank account

	Bank account
Gender	0.041 (0.61)
Age	-0.001 (-0.38)
Children	-0.110 (-1.43)
Wage	0.000*** (3.60)
Education	0.025 (0.39)
Married	0.123* (1.96)
Household size	0.008* (1.71)
Employment contract	0.179*** (2.56)
Obs.	199
Pseudo R ²	0.235

Notes: The dependent variable is to have a bank account (1 if yes, 0 otherwise). Coefficients are marginal effects. Z-statistics are reported in parentheses. *, **, *** indicate significance at 10%, 5%, and 1%, respectively.

Some of the companies in the sample could be driving these results. Indeed, some companies could make it mandatory to open a bank account to pay salaries. The disaggregated descriptive statistics available in Annex 3 show that no company appears to have a particular profile that would bias the results. Indeed, none of these companies has a specific policy on salary payments or requires employees to open a bank account. None of these companies has set up a specific partnership with a bank to promote their employees opening a bank account or to facilitate access to bank credit.

6. Conclusions

While access to credit is often cited as one of the tools for fighting poverty and a means to contribute to achieving the Sustainable Development Goals (SDG 1.4), Africa is far from having democratized access to credit for all. It is therefore important to better understand the determinants that improve access to credit.

Utilizing a new database of more than 200 employees in Senegal, we show the impact that having a formal employment contract has on an employee's access to credit. Through a probit model and by controlling for other socio-economic characteristics (age, gender, education, salary, etc.), we show that a formal employment contract increases an employee's probability of obtaining a loan by 23%. We explain this impact by a higher bank account penetration rate of formal employees since the employment contract increases the probability by 18% of an employee's having a bank account. Having a bank account affects both the supply of and demand for loan. On the one hand, it allows employees to become familiar with the financial services offered by banks and to improve financial literacy. On the other hand, it provides the bank a customer with a banking history that reduces information asymmetry and risk associated with granting credit. These results demonstrate the impact formalization can have on access to credit and highlights the economic development that an increase in formalization could help facilitate.

These results have strong implications for public authorities and companies throughout Africa. We urge all stakeholders to continue the formalization efforts underway in Africa's still predominantly informal economies. We also invite companies to encourage the banking of their employees by paying salaries via bank transfer.

Bibliography

- Adjei J.K., Arun T. and Hossain F. (2009) *"The role of microfinance in asset building and poverty reduction: The case of Sinapi Aba Trust of Ghana"*. Manchester: Brooks World Poverty Institute.
- Akpan P.U. (2013) *"Determinants of Credit Access and Demand among Poultry Farmers in Akwa Ibom State, Nigeria"*. American Journal of Experimental Agriculture 3(2):293-307, 2013.
- Akudugu MA. (2012) *"Estimation of the Determinants of Credit Demand by Farmers and Supply by Rural Banks in Ghana's Upper East Region"*. Asian Journal of Agriculture and Rural Development, 2(2): 189-200.
- Baffoe G. and Matsuda H. (2015) *"Understanding the determinants of Rural Credit Accessibility: The case of Ethiaminchini, Fanteakwa District, Ghana"*. Journal of Sustainable Development, 8: 183.
- Baiyegunhi L.J.S, Fraser G.C.G and Darroch M.A.G. (2008) *"Access to credit and the effect of credit constraints on household welfare in the Eastern Cape Province, South Africa"*. African Journal of Agricultural Research 2010, 5(16): 2243-2252.
- Barnes C, Keogh E. and Nemarundwe N. (2001) *"Microfinance program clients and impact: An assessment of Zambuko Trust Zimbabwe"*. Washington DC: Assessing the Impact of Microenterprise Services (AIMS).
- Barslund M. and Tarp F. (2008) *"Formal and informal rural credit in four provinces of Vietnam"*, Journal of Development Studies, 44(4): 485-503.
- Bigsten A., Collier P., Dercon S., Fafchamps M., Gauthier B., Gunning J.W., Soderbom M., Oduro A., Oostendorp R., Patillo C., Teal F., Zeufack A. (2003) *"Credit constraints in Manufacturing Enterprises in Africa"*. Journal of African Economies, 12(1): 104-125.
- Biyase M. and Fisher B. (2017) *"Determinants of access to formal credit by the poor households"*. Studia Universita Babes-Bolyai Oeconomica, 62(1): 50-60.
- Brannen C. (2010) *"An impact study of the Village Savings and Loan Association (VSLA) program in Zanzibar, Tanzania"*. BA Dissertation, Wesleyan University.
- Chaudhuri K. and Cheral M.M. (2011) *"Credit rationing in rural credit markets of India"*. Applied Economics, 44(7): 803-812.
- Crook J. (2001) *"The demand for household debt in the USA: evidence from the 1995 Survey of consumer finance"*. Applied Finance Economics, 11(1): 83-91.
- D'Espallier B., Guérin I. and Mersland R. (2009) *"Women and repayment in Microfinance"*. Working paper RUME No 2009-02. Provence University/RUME Project, Marseille.
- Fafchamps M. (2000) *"Ethnicity and credit in African Manufacturing"*. Journal of Development Economics, 61(1): 205-235.
- Feder G., Lau L., Lin J. and Luo X. (1989) *"Agricultural credit and Farm performance in China"*. Journal of Comparative Economics, 13:1151-1157.
- Foltz J., Larson B. and Lopez R. (2000) *"Land tenure, investment and agricultural production in Nicaragua"*. Discussion paper No 738, Institute for International development, Cambridge.
- Gubert F. and Roubaud F. (2005) *"Analyser l'impact d'un projet de microfinance: l'exemple d'ADEFI à Madagascar"*. Paris : DIAL (Développement, Institutions et Analyses de Long terme).
- Jappelli T. (1990) *"Who is credit constrained in the U.S Economy?"*. Quaterly Journal of Economics, 105(1): 219-234.

- Jia X. Heidhues F. and Zeller M. (2010) "*Credit rationing of rural households in China*". Agricultural Finance Review, 70(1): 37-54.
- Kedir A. (2003) "*Determinants of access to credit and loan amount; Household level evidence from Urban Ethiopia*", International Conference on African Development Archives, paper 64.
- Lacalle Calderon M., Rico Garrido S. and Duran NAvaroo J. (2008) "*Estudio piloto de evaluacion de impacto del programa de microcreditos de Cruz roja Espanola en Ruana*". Revista de Economia Mundial, 19 : 83-104.
- Lawal J. and Muiyiwa A. (2009) "*Food security and socioeconomic characteristics of cocoa farming households in Nigeria: support through agricultural biotechnology*". Proceedings of the 2nd international e-conference on Agricultural BioSciences.
- Magri S., Pico R. and Rampazzi C. (2011) "*Which Households Use Consumer Credit in Europe?*". Bank of Italy Occasional Paper No. 100.
- Okurut F.N. (2006) "*Access to credit by the poor in South Africa: Evidence from household survey date 1995 and 2000*". Working Papers 13/2006, Stellenbosch University, Department of Economics.
- Seefeldt K. (2015) "*Constant consumption smoothing, limited investments and few repayments: The role of debt in the financial lives of economically vulnerable families*". Social Service Review, 89(2): 263-300.
- Vaessen J. (2001) "*Accessibility of rural credit in Northern Nicaragua: The importance of networks of information and recommendation*". Savings and Development, 25(1): 5-31.
- Van Rooyen C., Stewart R. and De Wet T. (2012) "*The impact of Microfinance in Sub-Saharan Africa: A systematic review of the evidence*". World development, 40(11): 2249-2262.
- World Savings Bank Institute (2010) "*Financial service access can accelerate Millennium Development Goals achievement: Statement of 19 March*".
- Worthington A.C. (2006) "*Predicting Financial Litteracy in Australia*". Financial Services Review, 15(1).
- Zaman H. (2001) "*Assessing the poverty and vulnerability impact of micro-credit in Bangladesh: A case study of BRAC*". Unpublished background paper for World Development Report 2000/2001.

Appendices

Appendix 1: List of variables

Variable name	Type	Description
Dependent variables		
1) Have a credit	Dummy	1 = has a loan ; 0 = no loan
2) Not credit constrained	Dummy	1 = has loan or no loan because no need ; 0 = no loan because refusal anticipated or lack of collateral.
Explanatory variables		
Gender	Dummy	1 = woman ; 0 = man
Age	Continuous	Number of years
Children	Dummy	1 = has a child ; 0 = no child
Wage	Continuous	Wage amount in CFAF
Education	Dummy	1 = college or higher ; 0 = primary or no education
Marital status	Dummy	1 = married : 0 = single
Household size	Continuous	Number of people living in the household
Employment contract	Dummy	1 = formal contract ; 0 = informal
Bank account	Dummy	1 = bank account ; 0 = no bank account

Appendix 2: Contingency table, credit access

		TRUE	
		Y=1	Y=0
PREDICTED	$\hat{Y}=1$	53	17
	$\hat{Y}=0$	37	92

Notes: The correct answers correspond to the case where the model correctly predicted access to credit, i.e., it correctly predicts that the employee will have a credit ($Y = \hat{Y}=1$) or that the employee will not have a credit ($Y = \hat{Y}=0$). The correct answer rate is the ratio between the number of correct answers predicted and the total number of predictions. In our case, $(53+92) / (53+92+17+37) = 73\%$.

Appendix 3 : Descriptive statistics

	Number of employees surveyed	Share of formal employees	Share of employees with a bank account	Share of employees with a credit	Share of employees receiving their wage via bank transfer
Company #1	9	89%	67%	11%	0%
Company #2	35	86%	74%	43%	60%
Company #3	99	90%	75%	59%	70%
Company #4	28	79%	82%	32%	64%
Company #5	15	67%	75%	31%	67%
Company #6	14	29%	36%	0%	0%

“Sur quoi la fondera-t-il l’économie du monde qu’il veut gouverner? Sera-ce sur le caprice de chaque particulier? Quelle confusion! Sera-ce sur la justice? Il l’ignore.”

Pascal



Created in 2003 , the **Fondation pour les études et recherches sur le développement international** aims to promote a fuller understanding of international economic development and the factors that influence it.



Contact

www.ferdi.fr

contact@ferdi.fr

+33 (0)4 73 17 75 30