

Wealth, Credit Constraints and Investment ¹

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Abstract

O artigo explora o efeito da riqueza na decisão do pequeno empresário brasileiro em se tornar empregador na tentativa de investigar se as pequenas firmas no Brasil enfrentam restrições no mercado de crédito, e se estas restrições existirem como elas afetam a decisão de investir destes pequenos empresários. Usando as descontinuidades na probabilidade de se tornar um empregador, de obter crédito e na decisão de investimento quando a riqueza passa do 6th para o 7th decil, estimamos o efeito da riqueza na ocupação, e como a posição na ocupação está associada a obtenção de crédito e investimento. Esta estratégia se baseia em evidências de que em torno do ponto de corte da riqueza (0.001), os empresários são similares na média, exceto que alguns tiveram riqueza inicial suficiente para investir em projetos mais lucrativos e se tornaram empregadores, enquanto os outros não tiveram como obter capital inicial, investiram em projetos menos lucrativos, tornando-se contra-própria. Usando um procedimento em duas etapas em que a descontinuidade na riqueza serve como instrumento para escolha ocupacional, encontramos evidência de que a escolha ocupacional está de fato restrita pela riqueza e esta restrição impacta na decisão de investimento.

This article explores the effect of wealth discontinuities on occupational choice in order to investigate if small firms in Brazil faced credit constraints; and if these constraints exist, how they affect investments. We adopt an empirical strategy based on the jumps in the probability of obtaining credit, investment and occupational choice when the wealth moves from the 6th to the 7th decile. Our main argument is that the individuals with wealth above 0.001 are very similar with the individuals with wealth below this value, except that the one with wealth above 0.001 have enough wealth to borrow in the credit market and invest, while the others couldn't get the money to invest in a high return project and become an employer. We built a parametric approach that is simple an two step instrumental variable estimator using the wealth discontinuity as an instrumental variable for occupational choice. Our results point that occupational choice decision is in fact constrained by wealth and has significant effects on investment decision and access to credit.

JEL CLASSIFICATION: C5, D2, D3

KEY WORDS: WEALTH, OCCUPATIONAL CHOICE, CREDIT CONSTRAINTS, INVESTMENT, REGRESSION DISCONTINUITY

PALAVRAS CHAVES: RIQUEZA, DECISÃO OCUPACIONAL, RESTRIÇÃO DE CRÉDITO, INVESTIMENTO, REGRESSÃO DESCONTÍNUA

ÁREA: MICROECONOMIA APLICADA

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1 Introduction

One of the important characteristics of the small businesses in Brazil is the low productivity and profits. Many studies argue that this characteristic of the small firms in Brazil is a consequence of a restricted credit market. Bourguignon and Ferreira (2000) argue that the imperfections in the credit market do not allow the small firms to start projects that require a large amount of initial capital and have higher returns. Consequently, these small firms cannot invest in the more profitable projects, and the small entrepreneur in Brazil face low incomes. Other authors show that these small firms do not have collateral, the usual guarantee required for the banks to lend money. As a consequence, great part of their credit come from informal sources, like relative, friends, etc, and they face a limited amount of credit. In 1997, Neri and Giovanni (2003) show that only 7% of the 50 thousand firms that were investigated by ENCINF (Survey of the Informal Urban Economy) have had obtained credit from the formal sector.

Understanding the relationship between credit constraints and investment is very important, given that the credit constraints can be a barrier for investment in physical and human capital, and can be related to the low income of the self-employees and small employers in Brazil. As argued by Hurst and Lusardi (2004), if credit is limited and initial capital requirement is large, low wealth household will be able to invest in new projects and even to start a new business.

In this project, we investigate if the small firms in Brazil face credit constraints, and how this limited credit is related to their investments decisions. We define small firms as self-employees and employers with at most five employees.

The imperfections in the credit market are usual associated with asymmetric information. Jaffe and Russel (1976) explain the constraints in the credit market using the basic ideas of moral hazard and adverse selection. They build a model in which there are two types of borrowers, honest and dishonest. Honest borrowers accept only loan contracts and

they can pay; and dishonest borrowers default if the cost of default is low. The lenders know that there are two types of borrowers in the market, but they do not have any prior information about the type of a borrower. If they lend a great amount of money or increase the interest rate, they can attract only the dishonest borrowers. With the purpose of avoiding adverse selection, they decrease the interest rate and limited the amount of credit in the market. Stiglitz and Weiss (1981) use the same principles to explain credit constraints. These authors show how the incentives in the market can affect not only the type of potential borrowers (adverse selection) but also the behavior of the borrowers in the market (moral hazard). One of the drawbacks of these studies is that they explain adverse selection and moral hazard problems in the credit market using only changes in the interest rate. This approach is too simple since the credit markets are regulated by specific institutions and other mechanisms used in this market, like collateral, can be related to adverse selection and moral hazard.

Stiglitz and Weiss (1981), and Bell (1988) study how the collateral is related to the design of the contracts in the credit market. If borrowers can offer a collateral that exceeds the principal, there is full guarantee and no credit constraints. However, if the lenders request high value collateral, the contract may attract only the borrowers that are willing to invest in high risk project with a higher return. Even in the presence of the collateral, credit constraints can exist.

In this project, we relate credit constraint with the risk of a contract default. The household with low wealth that do not have the initial capital to start a new project need to borrow money in the credit market. Given the asymmetric information in the credit market, the lenders will requires some loan guarantees, like a collateral. The low wealth individuals could not provide these guarantees and have access to a limited amount of credit, as a consequence they cannot invest in projects that have higher returns.

Another side of literature, assume that there are credit constraints and study the impact of these constraints in investment, and how these constraints can explain the income

inequality and poverty in some countries. Banerjee and Newman (1991) and Banerjee and Newman (1993) relate credit constraints with income inequality. In the first paper, the authors understand credit constraints as a consequence of financial contract incentives. The insurance of a high risk contract with higher return is not possible because of "moral hazard", and the low-income households have limited access to credit, and cannot invest in human capital or projects with higher return. This limited access to credit is related with the persistence of income inequality. In the other paper, Banerjee and Newman relates credit constraints with occupational choice and income inequality. Aghion and Bolton (1997) study credit constraints in a moral hazard framework like in Banerjee and Newman (1991). In their model, the level of effort of an individual in a project is a decreasing function of the size of the loan. The agents are risk neutral, and they face a limited amount of credit in the market. These four studies understand the imperfections in the credit market as an asymmetric information problem. These imperfections can be of two types: limited credit for certain individuals or a higher risk premium applied to the amount borrowed. In this market, the low income individuals could not provide the guarantees requested to obtain the initial capital to start a high return project, and consequently, they invest in projects with low return. Limited access to credit is one of the mechanism that can be used to explain the persistence of income inequality.

Other papers investigate how credit constraints are related to the productivity of certain groups using household surveys or data about small businesses. Rosenweig and Wolpin (1993) study how the small land owners in India are affected by credit constraints. They develop a dynamic model in which the investment decisions are related to main characteristics of the small rural owners in India: small income and limited credit. The results of this model indicate low productivity and low profit are consequences of risk averse individual with low wealth and limited credit, and that credit constraints also increase the income volatility of these individuals.

Using a different approach, Kochar (1995) also investigates credit constraints in the

rural market in India. The author investigates if the rural households in India face constraints that are related to the formal rules that regulates the access to formal credit. He considers that there are two credit markets in India: a formal one and an informal market. The demand for formal credit can be low not only because of the rules that limited the participation of the rural population in this market, but also because the informal credit is a good substitute for the formal credit, and in the informal market the cost of transactions are lower than in the formal one. Another study about the credit market in rural India is Jacoby and Skoufias (1997). This study focuses on the relationship between the credit constraints and the accumulation of human capital. They investigate if credit constraints are related to child labor in India. If low income households have limited access to the formal and informal credit market, when the household income is very low, children in the rural households in India have to work to help at home. The consequences of child labor in India is low educational level, less accumulation of human capital and low productivity in the region. Townsend (2002) analyzes the credit market in Thailand. Using a household survey, the author provides evidence that there are credit constraints, and relates these constraints with income inequality and poverty. Ardagna and Lusardi (2008) uses micro data that has information of individuals in different countries to estimate the determinants of entrepreneurship. They find that one of the main determinants is regulation, measure by the barriers and costs entrepreneurs face to open a new business, the efficiency of the justice system in resolving commercial disputes, etc.

In Brazil, the number of studies that investigate if the small businesses face credit constraints and how they are related to investment are small. Pinto (2002) develops a model that relates credit constraints and productivity heterogeneity with the amount of capital used by the small firms and their profits. The author finds weak evidence that credit constraints is one of the determinants of the rentability of the small firms in Brazil. Using a household survey (PNAD) for the years of 1981 and 2001, Assunção and Alves (2007) show evidence that credit constraints impact intra-household decisions, like the decision of the

head of the household to become an entrepreneur, the amount of investment in education, and if the children work outside the household. Assunção and Chein (2007) investigate the credit market in the rural area in Brazil. They find evidence that the households in this area face limited credit access.

Given the importance of credit market, in this article we investigate if small firms in Brazil faced credit constraints; and if these constraints exist, how they affect investments. We find reliable evidence that there are constraints in the credit market of small firms in Brazil, and that these constraints have a negative impact on investment decisions.

2 Methodology

We work with a model that relates wealth with choice, like in Evans and Jovanovic (1989). There are only two occupational choices: self-employee or small employer (with at most five employees). If there are credit constraints, it should exist a positive relationship between household wealth and the probability of becoming an employee. If there are no credit constraints, the decisions of being a self-employed or a small employer is based on cost-benefit analyses. In this model, the credit market is a set of formal and informal practices that provide capital for certain investment projects.

Each individual can be represented by a vector (θ, a) , where θ represents the characteristics of the firm and a , its initial wealth. The occupational choice, e is a binary variable that equals 1 if the individual decides to be an employee, or 0 if he decides to be self-employed. The cost associated with each occupational choice is represented by $C(e, \theta)$, with $C(1, \theta) > C(0, \theta)$ and $C_\theta > 0$. The profit associated with each occupational choice is $L(e, \theta)$, and $L(1, \theta) > L(0, \theta)$.

If there is no credit market, individual i needs to use his initial income to start his new business. If there is a credit market, but individual faces credit constraints due to asymmetric information, the amount of capital that he can borrow to start a new business

is an increasing and continuous function of his wealth, $M(a)$.

At the end, individual (θ, a) will choose to become an employer if $C(1, \theta) \leq M(a)$. Define a^* as the level of income that satisfies the inequality, $C(1, \theta) = M(a^*)$. If there are credit constraints, only individuals with initial wealth above a^* will become an employer. Since $M_a(a) > 0$, if there is a credit constraint, individuals with initial wealth below a^* face limited credit and decide to become self-employed, and individuals with initial wealth above a^* are not constrained, and become an employer.

In this model, we assume that individuals that have household wealth very close to a^* are very similar in other characteristics, except that the ones that have $a^* - \varepsilon$ of household income could not borrow the initial capital to become an employer, and the ones with $a^* + \varepsilon$ have access to the credit market and borrow the amount they need to become an employer, where ε is positive and very small. Then comparison of the investment decision of the individuals with wealth just above the threshold, a^* , with the investment decision of individuals with wealth just below the threshold will give us the effect of credit constraints on investment.

Our empirical strategy is based on a regression discontinuity framework. Let E_i denote the occupational choice of individual i , with $E_i = 1$ if individual i is an employer, and 0 if individual i is self-employed. The probability of becoming an employer is increasing on household initial wealth since individuals need a higher level of initial capital to become an employer than to be self-employed, and the amount they can borrow in the credit market is an increasing function of initial wealth. We assume that at $a = a^*$, there is a small jump in the probability of being an employer, and this discontinuity is related to the relationship between credit and household wealth. In this case,

$$\lim_{a \downarrow a^*} \Pr [E_i = 1 | A_i = a] \neq \lim_{a \uparrow a^*} \Pr [E_i = 1 | A_i = a]$$

and assuming that investment is a continuous function in wealth at $a = a^*$, we can estimate

the effect of occupational choice on investment by comparing individuals with household wealth around a^* ,

$$\tau_{FRD} = \frac{\lim_{a \downarrow a^*} \mathbb{E}[Y_i | A_i = a] - \lim_{a \uparrow a^*} \mathbb{E}[Y_i | A_i = a]}{\lim_{a \downarrow a^*} \mathbb{E}[E_i | A_i = a] - \lim_{a \uparrow a^*} \mathbb{E}[E_i | A_i = a]}$$

where Y_i represents the investment decision in physical capital.

Using the argument above, one possible interpretation of τ_{FRD} is the indirect effect of credit constraints on investment that is due to how limited credit affects the occupational choice. We estimate the parameter of interest using a parametric approach. We use a two-step estimator. In the first step, we estimate the occupational choice variable (E) as a polynomial function of wealth and the indicator variable that A is bigger than a^* ; and in the second step we estimate the relationship between investment and E , using the predicted value of \hat{E} instead of E . This parametric approach is simple an two step instrumental variable estimator using the wealth discontinuity as an instrumental variable for occupational choice.

In addition, before estimating the relationship between occupational choice and investment, we investigate if there is evidence of credit constraints by using a fuzzy regression discontinuity design. The empirical strategy is the same one used in the case of investment. We use the same equation above, but with Y_i representing if individual i borrow money in the formal credit market in the last 12 months.

3 Data Description

In this article, we use a household survey, called ECINF (Survey of the Urban Informal Economy). ECINF is a survey that collects information about the informal sector in Brazil. Informal sector is defined as urban household of self-employees and employers with at most 5 employees. This survey was conducted by IBGE (The Brazilian Institute of Geography

and Statistics) in 1997 and 2003. In this article, we use data from ECINF 2003.

ECINF is a stratified sample in which the households are stratified by income and sector of activity. This survey collects information about 48.800 informal economic units in all urban areas in Brazil. One interesting aspect of ECINF is that it includes not only information about the small business, like amount of sales, credit obtained, but also about the owners of these business, like other sources of income, sex, age, education, etc. Table 1 presents the summary statistics of the sample. This table shows that only 87% of individuals are self-employed, and among this individuals only 6% have access to credit in the past 12 months, and 15% of them invested money in physical or human capital. 50% of them are white and the average age is 42 years old. These small business have been in market about 9 years on average. In addition, 33% of the small business are in the trade sector, 17% of them are in the building sector and 15% are in the processing industries.

Table 1: Descriptive Statistics

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
Employer	48809	10525954	0.1273	0.3333	0	1
Credit Access	48786	10521074	0.0624	0.2420	0	1
Investment	48781	10515008	0.1595	0.3662	0	1
Wealth	45599	9723693	0.0048	0.0156	0	1
Woman	48807	10525820	0.3333	0.4714	0	1
Age	48809	10525954	41.8731	12.6310	10	98
White	48790	10518264	0.5293	0.4991	0	1
Experience as an Owner	48757	10511970	9.3089	9.3559	0	74
Sectors						
Recreational Activities, Cultural and Sports	48418	10438133	0.0178	0.1324	0	1
Extractive Industries	48418	10438133	0.0035	0.0589	0	1
Processing Industries	48418	10438133	0.1548	0.3618	0	1
Building	48418	10438133	0.1736	0.3788	0	1
Trade, repair of motor vehicles, personal and domestic objects	48418	10438133	0.3358	0.4723	0	1
Accommodation and Food	48418	10438133	0.0698	0.2549	0	1
Transport, Storage and Communication	48418	10438133	0.0802	0.2716	0	1
Financial Intermediation	48418	10438133	0.0034	0.0581	0	1
Real Estate Activities, Rentals and Business Services	48418	10438133	0.0656	0.2476	0	1
Education	48418	10438133	0.0150	0.1215	0	1
Health and Social Care	48418	10438133	0.0187	0.1355	0	1
Other Collective, Personal and Social Service	48418	10438133	0.0007	0.0258	0	1
Personal Services	48418	10438133	0.0600	0.2376	0	1

Source: Authors' Elaboration based on Ecinf, 2003.

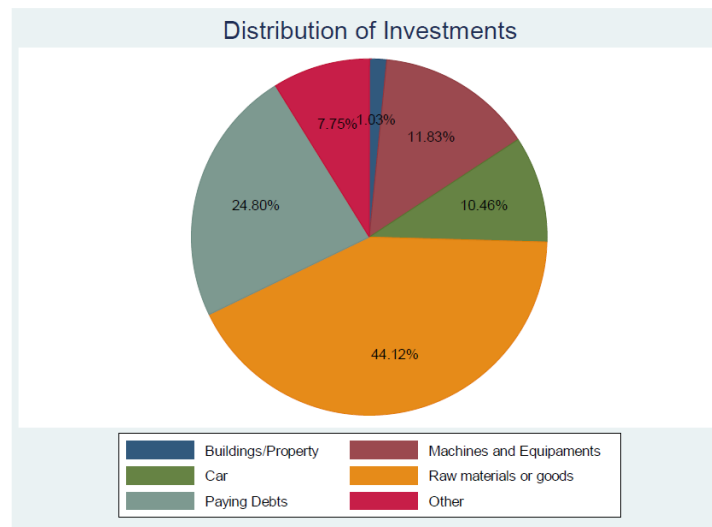


Figure 1: Graph 1: Distribution of Investments

Table 2 shows the source of capital used to start the business. This table shows that 32% did not need any capital to start the business, and 36% used their household wealth.

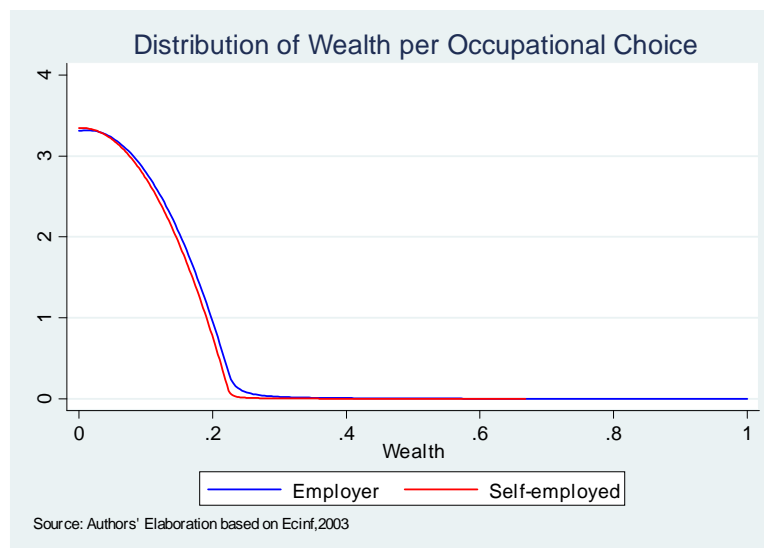
	Freq.	Percent	Cum.
Compensation Received	4,021.23	8.25	8.25
Bequest	841.08	1.73	9.98
Savings or sale of goods or property	3,241.56	6.65	16.63
Other own resources	17,734.75	36.4	53.03
Friends and Relatives Loan	3,723.46	7.64	60.67
Bank Loan	860.919	1.77	62.44
Other enterprises and people	729.6235	1.5	63.94
Partner had the capital	529.8817	1.09	65.03
Did not need any capital	15,432.90	31.67	96.7
Other	1,607.59	3.3	100
Total	48,723	100	

Source: Authors' Elaboration based on Ecinf, 2003.

Graph 1 shows that most part of the small firms use their profits to buy the basic inputs for production.

The wealth variable that we are going to use is a index composed of three variables, total value of initial equipment and infrastructure, if the household own the facility where

the business is located and if the household receives rent. This index is constructed using component analysis². We normalize this variable in such a way that it varies from 0 and 1. Graph 2 shows the histogram of this normalized variable, and it shows that about 85% of the individuals have wealth below 0.01 and 11% have wealth zero. The average wealth is 0.33. This graph shows that the small entrepreneurs in Brazil have a low level of wealth. In addition, this graph shows that the employers have higher wealth than the self-employees along the whole distribution.



Graph 2: Distribution of Wealth

Table 3 shows that investment and credit increase with the wealth level. We can also see from this table that there is a little jump in the probability of obtaining credit and the probability of investing when the wealth index goes from the 6th to the 7th decile. In addition, table 3 shows that the probability of being an employer increases with the wealth index. The relationship between occupational choice and wealth is not linear, with a jump in the probability of being an employer between the 6th to the 7th decile of wealth.

²In appendix A, we show the results of the principal component analysis used to construct the wealth index.

Table 3: Occupational choice, investment and credit access per quantiles of Wealth

	Wealth	Employer	Investment	Credit	Wealth Deciles
1	0.000000	0.013	0.091	0.009	0.000000
2	0.000035	0.014	0.136	0.019	0.000055
3	0.000109	0.019	0.137	0.021	0.000166
4	0.000241	0.034	0.126	0.039	0.000350
5	0.000469	0.066	0.146	0.048	0.000627
6	0.000921	0.116	0.160	0.079	0.001288
7	0.002022	0.238	0.195	0.111	0.003050
8	0.005924	0.321	0.198	0.111	0.009049
9	0.009587	0.112	0.199	0.062	0.010788
10	0.029141	0.416	0.272	0.167	

Source: Authors' Elaboration based on Ecinf, 2003.

In our empirical strategy, we explore the jumps in the probability of obtaining credit, investment and occupational choice when the wealth index moves from the 6th to the 7th decile. We argue that the individuals with wealth above 0.001 are very similar with the individuals with wealth below this value, except that the one with wealth above 0.001 have enough initial wealth to borrow in the credit market and invest, while the others couldn't get the money to invest in a high return project and become an employer. Table 4 compares the observable characteristics of employers and self-employees. This table shows that they are very similar in terms of age, sex, race and experience as an owner, but they differ when we compare credit access and investment. In addition, we have evidence that employers invests in higher return project than the self-employees, having a higher revenue.

Table 4: Comparative Analysis - Self-employed and Employer

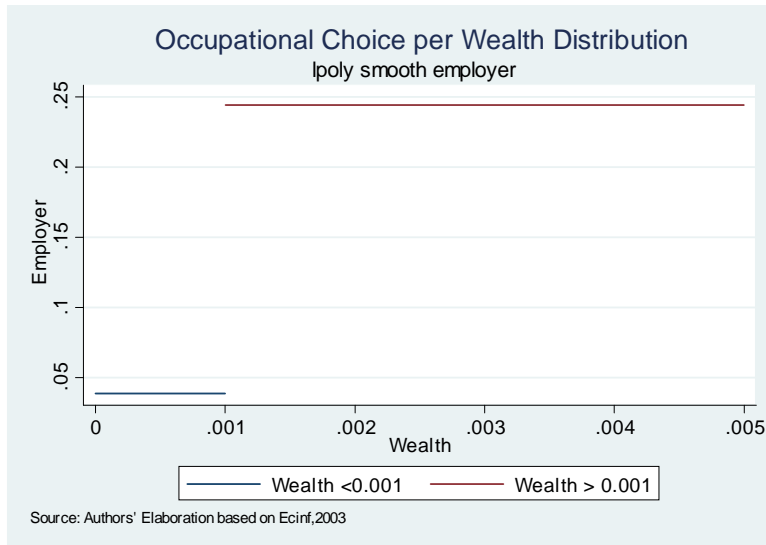
	Self_employed		Employer		Observations
	Mean	Standard Error	Mean	Standard Error	
Credit Access	0.051***	(0.002)	0.140***	(0.008)	48790
Man	0.656***	(0.004)	0.743***	(0.010)	48813
White	0.514***	(0.005)	0.634***	(0.010)	48813
Age	41.855	(0.121)	41.995	(0.254)	48813
Experience as na Owner	9.221***	(0.088)	9.910***	(0.198)	48761
Income (in Minimum Wage)	2.591***	(0.068)	6.900***	(0.181)	48459
Expenses (in Minimum Wage)	3.051***	(0.109)	19.965***	(0.769)	45603
Revenue (in Minimum Wage)	4.915***	(0.093)	28.259***	(0.942)	48054
Wealth	0.004***	0.000	0.013***	(0.001)	45603
Number of employees	1.115***	(0.003)	3.067***	(0.028)	48813
Investment	0.136***	(0.003)	0.318***	(0.010)	48785

Source: Authors' Elaboration based on Ecinf, 2003.

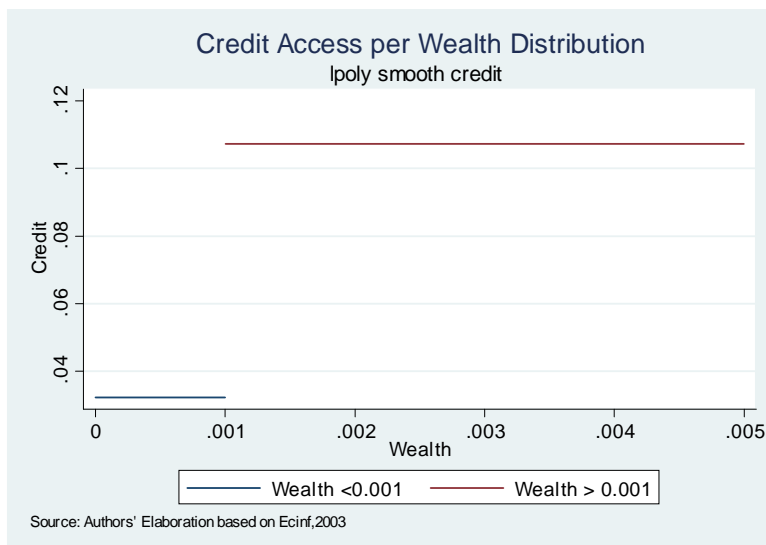
Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

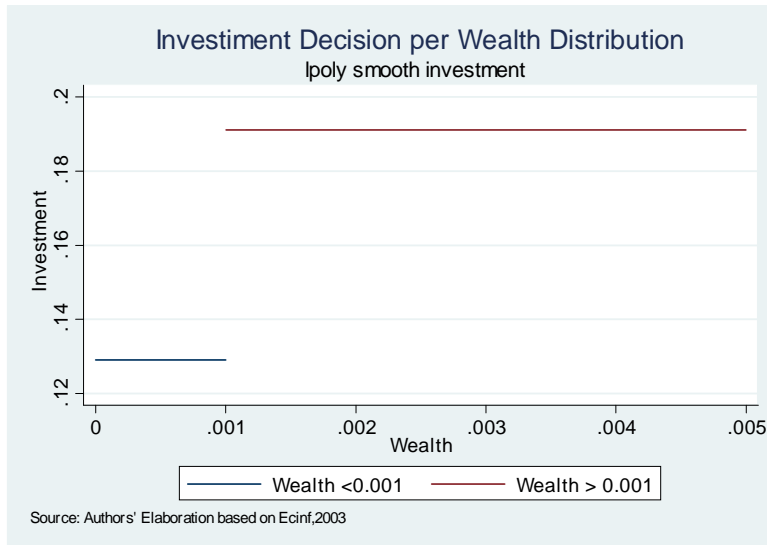
Our argument becomes clear when we plot the probability of being an employer against the wealth index. Graph 3 shows that there is a jump of about 0.20 in the probability of being an employer when wealth index is higher than 0.001. We can see the behavior when we plot the probability of having access to credit market against the wealth index. Graph 4 shows that the probability of borrowing from the credit market increases 0.08 when the wealth index crosses 0.001. Graph 5 shows the same pattern for investment. The probability of investing increases almost 0.10 points for individuals with wealth above 0.001.



Graph 3: Occupational Choice vs Wealth Index



Graph 4: Credit Access vs Wealth Index



Graph 5: Investment Decision vs Wealth Index

4 Results

In this section, we use the fuzzy regression discontinuity design proposed in section 2 to show if there are credit constraints for the self-employees and how these credit constraints can affect the investment. In this empirical strategy, we explore the discontinuities presented in graphs 4-6. We adopt a parametric approach. In the first stage, we estimate a regression that relates a dummy variable that equals 1 if the individual is an employer and 0 if he/she is self-employee with the wealth index and a binary variable that is 1 for individuals with wealth above 0.001 and 0, otherwise. This binary variable is called threshold. We also include in the regression the interaction between the threshold and the wealth index. Table 5 shows the results of the first step. We estimate three different models. Column (1) of table 5 presents the results with no controls, column (2) shows the results when we control for entrepreneur's characteristics, like sex, race, etc and column (3) shows the results when we control for individual's characteristics and sector. We focus in the results of column (3). We have evidence that the probability of becoming an employer increases by 0.243 when the wealth index crosses the threshold. However, the effect of the wealth index is positive

but lower for individuals with wealth index bigger than 0.01. In addition, the results of columns (4) to (5) explores the effect of wealth discontinuity on investment decision, it ranges from 0.088 to 0.121. For completion, table 5 shows the results of a model that relates a dummy that equals 1 if individual i had access to the credit market in the last 12 months and 0 otherwise with the wealth index, the threshold and the interaction between these variables. The results show that the probability of obtaining credit increases by about 0.08 when wealth index crosses 0.001 and the coefficient associated with the interaction is negative which indicates that the employers are less constraint than the self-employees, since the credit access depends less on the level of wealth.

Table 6 reports the second stage of our two step instrumental variable estimator using the wealth discontinuity as an instrumental variable for occupational choice. We find evidences that the probability of investment increases by 0.317 when the individual is an employer, with all controls for entrepreneur's characteristics and sector. The effect of being an employer on credit access is even bigger, 0.468.

Table 5: Regression Discontinuity Model Estimates

	Employer			Investment			Credit		
	1	2	3	4	5	6	7	8	9
Threshold	0.225*** (0.007)	0.222*** (0.007)	0.243*** (0.008)	0.088*** (0.008)	0.092*** (0.007)	0.121*** (0.008)	0.088*** (0.005)	0.089*** (0.005)	0.079*** (0.005)
Wealth	119.023*** (11.037)	111.694*** (11.023)	144.944*** (12.618)	64.715*** (15.546)	61.797*** (15.395)	99.970*** (16.024)	76.400*** (9.002)	76.659*** (8.918)	60.441*** (9.323)
Threshold*Wealth	-116.776*** (11.042)	-109.482*** (11.029)	-142.780*** (12.627)	-63.960*** (15.548)	-60.941*** (15.397)	-99.058*** (16.027)	-75.712*** (9.004)	-75.949*** (8.921)	-59.726*** (9.324)
Woman		-0.047*** (0.005)	-0.043*** (0.007)		-0.015** (0.006)	-0.017** (0.007)		0.007 (0.004)	0.009* (0.005)
Age		-0.001*** (0.000)	-0.001*** (0.000)		-0.003*** (0.000)	-0.002*** (0.000)		-0.000** (0.000)	0 (0.000)
White		0.072** (0.034)	0.077** (0.034)		0.104*** (0.028)	0.114*** (0.031)		0.028 (0.024)	0.023 (0.024)
Black		0.043 (0.035)	0.049 (0.036)		0.092*** (0.030)	0.104*** (0.032)		0.019 (0.024)	0.016 (0.024)
Yellow		0.124** (0.052)	0.114** (0.052)		0.103** (0.044)	0.102** (0.045)		0.014 (0.031)	0.01 (0.031)
Brown		0.051 (0.034)	0.060* (0.034)		0.102*** (0.028)	0.118*** (0.031)		0.031 (0.024)	0.026 (0.024)
Recreational Activities, Cultural and Sports			0.163*** (0.035)			0.192*** (0.056)			0.026 (0.034)
Extractive Industries			0.271*** (0.092)			0.113 (0.082)			-0.008 (0.033)
Processing Industries			0.183*** (0.030)			0.076 (0.049)			0.017 (0.032)
Building			0.227*** (0.030)			0.132*** (0.049)			0.016 (0.032)
Trade, repair of motor vehicles, personal and Accommodation and Food			0.156*** (0.030)			0.033 (0.048)			0.044 (0.032)
Transport, Storage and Communication			0.159*** (0.031)			0.07 (0.049)			0.026 (0.032)
Financial Intermediation			0.092*** (0.030)			0.054 (0.049)			0.061* (0.033)
Real Estate Activities, Rentals and Business Services			0.147*** (0.047)			0.052 (0.063)			-0.016 (0.034)
Education			0.183*** (0.031)			0.133*** (0.050)			0.035 (0.033)
Health and Social Care			0.220*** (0.036)			0.107* (0.055)			0.043 (0.036)
Other Collective, Personal and Social Service			0.380*** (0.038)			0.115** (0.052)			0.036 (0.035)
Personal Services			0.114** (0.054)			0.329* (0.169)			-0.012 (0.034)
Experience as an Owner			0.141*** (0.030)			0.215*** (0.051)			0.011 (0.033)
Constant	0	0	0	0	0	0	0	0	0
Observations	0.010*** (0.002)	0.005 (0.035)	-0.187*** (0.046)	0.114*** (0.005)	0.138*** (0.030)	0.006 (0.058)	0.014*** (0.002)	-0.002 (0.025)	-0.026 (0.040)
R-squared	45188	45188	45188	45188	45188	45188	45188	45188	45188
	0.12	0.12	0.14	0.01	0.02	0.04	0.03	0.03	0.03

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6 : Regression Discontinuity Design IV Estimates		
	Investment	Credit
Employer	0.317*** (0.020)	0.468*** (0.029)
Woman	0.023*** (0.005)	0.002 (0.007)
Age	0 0.000	-0.002*** 0.000
White	-0.002 (0.021)	0.076*** (0.022)
Black	-0.001 (0.021)	0.079*** (0.025)
Yellow	-0.027 (0.030)	0.046 (0.039)
Brown	0.006 (0.021)	0.088*** (0.022)
Recreational Activities, Cultural and Sports	-0.025 (0.032)	0.117** (0.050)
Extractive Industries	-0.095** (0.047)	-0.016 (0.094)
Processing Industries	-0.041 (0.030)	-0.01 (0.044)
Building	-0.057* (0.030)	0.023 (0.044)
Trade, repair of motor vehicles, personal and domestic objects	-0.004 (0.030)	-0.039 (0.043)
Accommodation and Food	-0.023 (0.030)	-0.003 (0.044)
Transport, Storage and Communication	0.033 (0.031)	0.013 (0.044)
Financial Intermediation	-0.061* (0.033)	-0.016 (0.054)
Real Estate Activities, Rentals and Business Services	-0.022 (0.030)	0.049 (0.045)
Education	-0.027 (0.034)	0.003 (0.050)
Health and Social Care	-0.084** (0.034)	-0.061 (0.049)
Other Collective, Personal and Social Service	-0.05 (0.031)	0.272 (0.172)
Personal Services	-0.033 (0.030)	0.148*** (0.046)
Experience as an Owner	0 0.000	-0.001*** 0.000
Constant	0.037 (0.036)	0.104** (0.049)
Observations	45188	45188

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

5 Conclusion

In this paper we explore the effect of wealth discontinuities on occupational choice in order to investigate if small firms in Brazil faced credit constraints; and if these constraints exist, how they affect investments. We adopt an empirical strategy based on the jumps in the probability of obtaining credit, investment and occupational choice when the wealth index

moves from the 6th to the 7th decile. Our main argument is that the individuals with wealth above 0.001 are very similar with the individuals with wealth below this value, except that the one with wealth above 0.001 have enough wealth to borrow in the credit market and invest, while the others couldn't get the money to invest in a high return project and become an employer. We built a parametric approach that is simple an two step instrumental variable estimator using the wealth discontinuity as an instrumental variable for occupational choice. Our results point that occupational choice decision is in fact constrained by wealth and has significant effects on investment decision and access to credit.

In an ongoing work, we are estimating a nonparametric version of the regression discontinuity design. These results will be a good robustness check to the parametric ones. After doing robustness checks, we plan to do simulations in order to answers questions that help the microcredit policy in Brazil. For example, it will be interested to simulate what is the impact in the investment decision if all the individuals with positive wealth have credit access.

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A Appendix A: Principal Component

Table A1: Principal Components Analysis - Wealth Variable				
Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.03462	0.0236772	0.3449	0.3449
Comp2	1.01094	0.0565064	0.3370	0.6819
Comp3	0.954437	.	0.3181	1
Principal Components Eigenvectors				
Variable	Comp1	Comp2	Comp3	Unexplained
Value of Equipments and Machines	0.6390	-0.4764	0.6039	0
Renting	0.7405	0.1682	-0.6507	0
Place	0.2084	0.8630	0.4603	0

Source: Authors' Elaboration based on Econf, 2003.