

The role of formality on access to credit for Micro and Small Firms

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ABSTRACT

Understanding financial constraint is fundamental to analyse the role of high barriers across Micro and Small enterprises in developing countries. This research identifies the role of formality on Micro and Small firms on access to credit. In order to analyse formality across Peruvian firms, this research using *license* variable. Firm-level data called the National Enterprises Survey (NES), it is provided by the Statistics Peruvian National Institute (INEI). This paper uses the Instrumental Variables (IV) method, and finds that when firms have license more likely probability access to credit (from formal to informality), on average. On the other hand, these findings confirms that the real effects of license increase between 15 to 19 percentage point access to credit and reduce 16 percentage points financial constraints for MSEs.

Keywords: access to credit, credit constraint, micro firms, small firms

RESUMEN

Comprender las restricciones financieras es fundamental para analizar el papel de las altas barreras en las micro y pequeñas empresas en los países en desarrollo. Esta investigación identifica el papel de la formalidad en las micro y pequeñas empresas en el acceso al crédito. Para analizar la formalidad en las empresas peruanas, esta investigación utilizó la variable *licencia*. Los datos a nivel de empresa denominados Encuesta Nacional de Empresas (ENE), son proporcionados por el Instituto Nacional de Estadística del Perú (INEI). Este artículo utiliza el método de Variables Instrumentales (IV) y encuentra que cuando las empresas tienen licencia, es más probable que tengan acceso al crédito (de formal a informalidad), en promedio. Por otro lado, estos hallazgos confirman que los efectos reales de las licencias aumentan entre 15 y 19 puntos porcentuales en el acceso al crédito y reducen en 16 puntos porcentuales las restricciones financieras para las MYPES.

Palabras clave: acceso al crédito, restricciones crediticias, microempresas, pequeñas empresas

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Introduction

Several papers analyse that firms face substantial credit constraint with less developed financial systems across developing countries (Barnerjee and Duflo, 2014). In developing countries, several policymakers introduce incentives and stimulate growth on firms with less sales through their access to credit or financial instruments. Moreover, the role of financial tools on Micro and Small Enterprises* (MSEs) can improve their performance in the short and long term. Therefore, a clear identifying firms with less likely access to credit, will provide an effective program or intervention to reduce financial constraint on MSEs.

Growing literature describes the role of informality about access to formal finance, although mainly focused on large and medium-sized firms (Barnerjee and Duflo, 2014), (Koeda and Dabla-Norris, 2008), (Aga and Reilly, 2011). There are several reasons to believe that Firm's informality can be a crucial limitation to credit access. While screening borrowers, lenders demand extensive information, including proper documentation of registration and an operating license, tax-compliance and externally audited financial statements. For instance, the formality across small firms has will costly across time and sources. The main reason concerns to several small firms opt to consider formal sector means it is too expensive and time-consuming to do higher than other operations McKenzie and Woodruff's (2006). Another example, avoiding taxes and regulations makes

small firms informal more able to compete with their large formal counterparts Farrell (2004).

In Peru, 70% of the economic activity is informal, most of this percentage of informality concentrates across MSEs. Moreover, several firm owners feel that the formal sector has more disadvantages than advantages. There are several reasons to believe that. One of the reasons is related to financial constraint, and it means that credit access will support liquidity constraint and improve MSE's performance. According to the Ministry of Production (PRODUCE), MSEs have less access to Banks' credit, only less than 2% of them can access formal credit access.

This research's main question analyses the causal effect of informality as determinants of access credit across MSEs. To analyse that, this research uses Peruvian enterprises survey;

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*Firm-size defines as a result of sales for the year, them have 0-150 UIT (Tax measure units, acronyms in Spanish). Firms with 0-150 UIT are categorized as micro, and firms with 150-1700 UIT are categorized as small firms

†See the National Institute Statistics (INEI, Acronym in Spanish) describes labour force statistics annually.

‡The Ministry of Production (PRODUCE) describes annually enterprises dynamic across Micro and Small enterprises (MSEs) on the economic activity, for instance, labour market, financial sector

it calls ENE (acronym in Spanish). The ENE collects the firm's information across micro, small and Medium and Large enterprises; also representative across each economy activity and regions. One of the survey's essential strengths is its coverage of micro and small enterprises (99 % of the observations are from micro and small size firms). Another advantage of the ENE is that it includes information on financing sources that are often associated with micro and small-firm finance such as access to credit, balance sheets and informal sources. The empirical strategy is also related to the instrumental variables approach (IV) to measure the relationship between credit access and formality across MSEs in Peruvian enterprises.

The main contribution of this research proposal has three main advantages. First of all, understanding financial constraint is fundamental to analyse the role of high barriers across Micro and Small enterprises in developing countries, for instance, Peru. Secondly, this research proposal could measure the causal effect of formality due to access credit. Finally, to answer the causal effects across firms, this research uses the first National Enterprises Surveys across micro and small firms, it was implemented by the Ministry of Production in Peru (2018).

Literature Review

Several developing countries describe that credit market shows imperfections across small and micro firms or firms with less size. There are several factors to believe that, however, the main two factors could explain these imperfections are related with the microeconomic theory. First of all, the role of agent against principal given mismatch information, it calls asymmetric information and enough collaterals or weak contract enforcement. Several papers describe that these factors play an important role in lenders' behaviour and change the price mechanism to clear the market (Stiglitz and Weiss, 1981).

In order to analyse the imperfect information, higher financial constraints across firm dynamics are the main financials' characteristics. These financial constraints came from mismatch between supply (financial history across firms) and demand (higher interest rate) on credit market. More deeply, the adverse selection and moral hazard are problems came from agency problem theory between the bank (principal) and the Micro and Medium Enterprises (MSEs). Therefore, several bank's constraints implemented financial instrument to analyse their potential borrowers, for example, higher interest rate to avoid loss on their borrows and credits (Aga and Reilly, 2011) (Pandula, 2011).

Several MSEs has been not financial history in order to access to credit across financial institutions. As a result of that, most MSEs operate on informality due to does no access to credit, which means reverse effects between informality and financial constraints across MSEs. Therefore, these reverse relationship between financial constraint and informality means that informality will be endogenous to credit access that several empirical studies need to explain (Aga and Reilly, 2011) and (Wellalage and Locke, 2013).

The majority MSEs are informal due to conserve sources that can be used for capital investment in the medium and long term. However, there are more disadvantages than advantages when firms operating on informality,

for example, business registrations, access to external capital, inefficiency using resources, disincentives for capital accumulation and innovation and fewer productivity. Most developing countries describe these advantages across several MSEs that operating across informality, which means negative effects on the short term on productivity and growth economics (White, 2010), (Straub, 2005) and Lin and Ma (2014).

New literature and empirical evidences describe how these financial constraints imply difference across several owner's characteristics, such as gender, age and migration. Most female owners with fewer productivity could be explained as a result of less credit access rather than male owners (Aga and Reilly, 2011) and (Wellalage and Locke, 2013). However, there are ambiguous effects (positive or negative) that female owners show face to access credit and the relevance to access credit on firm's outcomes (Hansen & Rand, 2014), (Wellalage and Locke, 2013).

Methodology

Data

This research proposal uses the National Enterprises Survey (ENE, acronym in Spanish). This survey is representative of legal firms provided by the Peruvian National Statistics Office (INEI, for its initials in Spanish). The final sample given each year of the ENE came from two administrative datasets, first, the Central Directory of firms and universe of legal firms, which is collected by the Peruvian Tax authority (SUNAT, for its initials in Spanish). The ENE covers firms' information that developed economic activities across twenty-four departments and Callao constitutional province. The economic activities were built through the International Standard Industrial Classification (ISIC) revision 4.

Table 2 describes the full set of variables used, while table 1 shows selected summary statistics. There is only 46 % of firms have actually access to any kind of credit. These findings are close across two measure to access to credit for firms. First measure, version 1 (when MSEs access to credit came from bank or microfinance institutions) show that there is 40 %. In contrast, version 2 describes that only 38% of firms can access to credit (assets or capital credit).

In order to find the main factors on access to credit for MSEs, this research implemented variables related with owner's characteristics such as demographic (gender and age) and entrepreneurial motivation; on the other hand, firm's characteristics such as, size, number of employees and location (region).

Table 2 reports that on average, 49 years are age owners across firms. About owner, dummy variable when takes a value of 1 if one when owner rent firms and 0 otherwise, 76 % of the firms are exclusively owned. Motivation variable describes the role of owner to achieve their targets in the short term. According to the summary, 7 % of owners introduce their business because his/her motivated to operate in the market. Motivation entrepreneurs report a strong relationship between credit and firm's performance. According to the ENE, question: why the owner is in this business, whether owners are in the business because they have the skill required to run the firm, it takes value one and 0 otherwise.

On the other hand, one manifestation of motivation is the perception the person has about his/her in achieving their objectives (Aga and Reilly, 2011). Therefore, motivation entrepreneurs report a strong relationship between credit and firm's performance, this study use question: why the owner is in thus business, whether owners are in the business because they have the skill required to run the firm, it takes value one and 0 otherwise. Nevertheless, using this measure, 7% of the firms are owned by motivated entrepreneurs as defined in this way.

Moreover, other set variables are related with firm's attributes. In this study we implemented main variable related with permission to operate in the market, this is license, it captures firm operating across market, it takes value one when firms have right for operate and they are classified as a legal firm and 0 otherwise. Table 2 shows that 41 % of firms show have legal permission to implemented their business on market, as well as these firms are formal. The age variable describes the age of the firm, while workers define the total number of employees. On average, MSEs have 11.5 years' operating on market and 15 employees were hiring for these firms.

Other firm's characteristics describe the role of network and type of activity across economy. In order to measure the role of information that several MSEs can sharing between them, this study included business association variable. This business takes values 1 whether firms beyond business association and 0 otherwise[§] According to the findings of table xx, only 20% formal MSEs be part of business association, which means fewer network between micro and small legal firms on market. Last but no last, this study analyse several MSEs come from manufacturing (41%), services (35%) and commerce (24%) because these sectors have most of MSEs on Peruvian firms.

Empirical strategy

Probit

The main question of this study examines the role of formality and access to credit, given firms (MSEs) operating with permission (license) and how imply less constraint to access credit rather than other firms without permissions (no license). Therefore, given no lineal dependent variable to access to credit, this study following probit model framework:

$$y_i^* = X_i' \beta + \varepsilon_i \quad (1)$$

Equation (1) describes theoretical model to assess access to credit, where y^* is latent dependent variable given the case when firms access to credit and otherwise. Moreover, X' includes all firm's and owner's characteristics across firm i (age, gender, economy activities and so on). Finally, the error term is assumed normally distributed with mean and variance constant.

Instrumental variables

The majority of linear regression only describes the correlation between dependent and independent variables, there is not causal effects because there is not assignment fashion across main variable to analyse. Therefore, this

not randomly assignment will generate biased coefficients, which is related with endogenous problems across estimation coefficients.

In this study, there is reverse causality between financial constraints and informality across micro and small firms. Thus, that informality is not exogenous face to access to credit for firms, which means that marginal effects measure across no lienal regression (probit model) will be biased and hence the findings misleading. As a consequence of that, license variable to measure formal or legal status across firms will address potential endogeneity and license coefficient potential biased (Aga and Reilly, 2011).

Most empirical evidence has been implemented several ways to clean and measure the causal effects. In order to avoid biased coefficient given by no exogenous relationship between informality and financial constraints, this study uses instrumental variable approach (IV) to measure causal effect of license variable on probability to access credit or reduce financial constraints across firms (Angrist & Krueger 2001, 80).. Moreover, to avoid harmful understanding first stage predictions using probit model, this study implemented a linear probability model (LPM) in the first stage regression using correction for heteroscedastic through variance-covariance robust[¶]

Therefore, this study implemented three dummy variables as instrument variables to estimate causal effect on IV approach. These are Z1 (when firm sets its own price or not), Z2 (whether the firm's ownership structure is sole proprietorship or not) and Z3 (whether the firm's maintains accounting record or not). Further, the informality avoids paying taxes or social security; therefore, these instruments describe the opposite fact; thus, each instrument variable reflects the severity of authority through the probability of beginning a formal firm, see (Wellalage and Locke, 2013).

This study describes next equations:

$$y_{1i}^* = \beta \widehat{license}_i + X_i' \gamma + \varepsilon_{1i} \quad (2)$$

$$\widehat{license}_i = \delta Z_i + \varphi X_i' + \mu_i \quad (3)$$

The equation (2) describes structural equation to measure two outcomes given by laten variable y_{1i}^* (access to credit). On the other hand, equation (3) depicts reduce equation to analyse relationship between instrumental variables and $license_i$. Therefore, using IV approach for the first stage equation, using predict values of endogenous variables $\widehat{license}_i$ into the structural equation to analyse causal effect on depended variable.

Moreover, this research follows the guidelines of previous empirical studies that determine and analyse the relevance across each instrument on reducing equation (Aga and Reilly, 2011). On one hand, F-test analyses join significance related with all instruments to predict endogenous variables (license variable). The F-test must be more than 10

[§]A firm that is a member of a business association is 18 percentage points more likely to have access to credit than firms that are not members of such organisations (Aga & Reilly, 2011).

[¶]Test calls Cook-Weisberg for heteroscedasticity, the null hypothesis if homoscedastic errors was decisively rejected for the reduced-form LPM.

value following Stock and Yogo (2005). On the other hand, the second rule of this guideline implement the Hanses J-statistics to assess exogenous conditions across instrumental variables and error terms on equation (1). In addition, this last test is associated when the empirical study adjusts the model against the presence of heteroscedasticity.

Results

This section describes the main findings follows the empirical strategy to measure the causal effect when firms have licenses to operate on access to credit and financial constraints. Table 3 shows the main findings of LPM and IV approaches.

Column 2 shows the coefficient of likely to access to credit (capital) for firms when MSEs have license to operate on market. Moreover, column 4 describes estimates for access to credit whether firm has ever received a credit from bank or microfinance. Finally, column 6 reports estimate for financial constraint whether the firm has never access to credit or loan form bank or microfinance institutions.

For all measure to capture access to credit and financial constraints for MSEs, there is a formality positively effects on firms, when they operate with license in their business (moving from begin informal to formal), however, these effects are not significance. Therefore, as given columns 2 and 4 describe that an operating license increases a firm's access to credit from 1 to 2 percentage points, on average and ceteris paribus. On the other hand, as given column 6 reports that license variable decreases financial constraints, on average and ceteris paribus. These preliminary findings describe the role of informality on a firm's access to credit.

On the other hand, IV approach result was implemented across (3), (5) and (7) columns of table 3. The three dummies implemented on this study achieve the rule or guideline of relevance and exogenous conditions to measure causal effects of license on outcome variables. Therefore, there is 19 percent likely that MSEs access to credit when these firms operate with legal form or license. In addition, MSEs has 16 percent less likely to have financial constraint across firms with license work with all legal permission across market.

According to the rules, F-test of instrument is more than 10 values (92 values) to achieve and prove relevance condition across instruments. In addition, to measure exogenous condition, this study implemented Hansen J-test that are not significance and prove that license variable is exogenous on credit access, also face heteroscedasticity presence across model

Therefore, these main findings show the role and relevance to operate any activity across legal and formal status for each firm. In addition, this condition will increase likely access to credit (capital and any kind of credit) and reduce less likely to financial constraints front financial institutions across firms with less size rather than medium and large firms.

Conclusion

Growing literature describes the role of informality about access to formal finance, although mainly focused on large and medium-sized firms (Barnerjee and Duflo, 2014),

(Gatti and Honorati, 2008), The role of MSEs in developing countries are crucial because majority of them operate on informality and play against possibility develop across Productivity policy across firms, therefore, this main finding of this study describes the role and advantages formality across MSEs on financial system to achieve access credit in Peru.

The main contribution of this research focus on factors that are important determinants of MSEs access to finance in Peru. Informal firms are less likely to be access to credit than their formal counterparts. Therefore, there need more formalization program of such firms can be a potentially beneficial policy in the short term. MSEs owned by female are found more likely to be access to credit than those owned males, there is a gender dimension to access to credit (Wellalage and Locke, 2013), (Bastgen and Holzner, 2017), (Aga and Reilly, 2011). Moreover, when firms are member of business association, this impossibility to access to credit and reduce financial constraints, because there is a networking theory related with supply trade and credit arrangements between firms.

As a result of robustness checks on the regression models, given by diagnostic tests and arguably yield, future research can introduce and improve on analysis for two ways. First, dependent variable is that it is defined on the basis of demand-side In addition, future research can include analyses time of firms to access to credit and transition to pass from informality to formality across MSEs.

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Tablas

Table 1. Descriptive Statistics

	Firms	Mean	Median	Min.	Max.	Std
Any credit firms	4089	0.46	0.00	0.00	1.00	0
Credit firms (capital)- version 2	4089	0.38	0.00	0.00	1.00	0
Financial constraints 1	4089	0.60	1.00	0.00	1.00	0
License firms	4089	0.41	0.00	0.00	1.00	0
Part. female	4089	0.20	0.00	0.00	1.00	0
Firmsowner not rent (z3)	4089	0.76	1.00	0.00	1.00	0
Assosiation	4089	0.20	0.00	0.00	1.00	0
Age firms	4089	11.50	10.00	1.00	28.00	7
Accounting firms	4089	0.75	1.00	0.00	1.00	0
Informal competitive	4089	0.79	1.00	0.00	1.00	0
Age owners	4089	49.36	49.00	27.00	71.00	10
Motivation entrepenours	4089	0.07	0.00	0.00	1.00	0
workers	4086	15.51	6.00	2.00	1,262.00	47
Manufacturing	4089	0.41	0.00	0.00	1.00	0
Comerce	4089	0.24	0.00	0.00	1.00	0
Services	4089	0.35	0.00	0.00	1.00	0

Source: ENE - INEI. Elaboration: Author

Table 2. Description of Variables

Variables	Description
Credit all (any credit)	= =1 whether firms access to credit (capital, investment and others) from Bank and Microfinance Institutions (MFI)
Credit for capital	= =1 whether firms access to credit for capital (assets equitment)
Financial constraint	= =1 whether firms has credit constraints from Bank and Microfinance Institutions (MFI)
License	= =1, whether firms operate their business
female	= =1, female firms-owned
workers	Total amount of permanent employees (Number of employees)
busassoc	= =1, whether firms are member of bussines association)
Age	Number of years
Small	= 1 if the firm is a Small
Medium	= 1 if the firm is a Medium
Manufacturing	= 1 if the firm is a Manufacturing sectors
Commerce	= 1 if the firm is a Commerce sectors
Services	= 1 if the firm is a Services sectors

Table 3. Financial Consideration: OLS vs IV

	Credit access (capital)		Credit access (All)		Financial constraint	
	OLS	IV	OLS	IV	OLS	IV
Firms with license	0.02 (0.02)	0.19*** (0.07)	0.02 (0.02)	0.15** (0.07)	-0.01 (0.02)	-0.16** (0.07)
Adj. R ²	0.07	0.04	0.08	0.06	0.07	0.05
F-Test of Instrument		92.0		92.0		92.0
Hansen J test (p-value)		0.9		0.3		0.8
Controls	√	√	√	√	√	√
Region FE	√	√	√	√	√	√
Observations	4086	4086	4086	4086	4086	4086

Source: ENE - 2018. Elaboration: Author Note: firms characteristics, employees