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JESP is an international journal aiming to promote the development of methods and applications in economics, statistics and social science. The journal overcomes the linguistic barriers offering title and abstract in three languages, keywords and paragraph titles in English. JESP is culturally open. The author is free to choose the language to be used in text. "Shorts" does not mean "easy", on the contrary the format of JESP, three languages and 2 pages with two columns each, constrains the authors to a "weighted synthesis". MARTA's corner (MARTA - Methods and Approaches for Research and Teaching Applications), finally, is the corner where it is possible to find solutions of practical problems. Researchers will be able to learn how to use techniques for the management, analysis and synthesis of data.

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ESeC (Economic Statistics no-profit Association)
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Woman Entrepreneurs and the Credit Market in Italy

Il mercato del credito e le donne imprenditrici in Italia

Les femmes chefs d'entreprise et le marché du crédit en Italie

Daniele Coin • Maurizio Romeo

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Abstract. Bank of Italy Central Credit Register provides information on the whole Italian micro enterprises population having loans with the Italian banking system. By these data we investigate if female owned firms are discriminated or not in accessing the credit market in Italy.

Abstract. La Centrale dei Rischi di Banca d'Italia fornisce informazioni sull'intera popolazione di ditte individuali aventi debiti con il sistema bancario italiano. Utilizzando questi dati si è studiato se le aziende con proprietario donna sono discriminate o meno nell'accesso al mercato del credito.

Abstract. La Centrale des Risques de la Banque d'Italie fournit des informations sur l'entière population des entreprises individuelles ayant des dettes avec le système bancaire italien. Par ces données on a étudié si les entreprises avec une femme comme propriétaire sont discriminées ou non relativement à l'accès au marché du crédit.

Keywords: Small Business Credit; Lending Discrimination.

JELclassification: G21, J71.

1. Introduction

Micro enterprises owned by women make up a growing share of Western economies.

However some recent studies found that women- and minorities- owned business face barriers to access to the credit market (see Blanchard, Zhao and Yinger, 2008).

This phenomenon was investigated especially in North America and in developing countries (see Blanchard, Zhao and Yinger, 2008; Riding and Swift, 1990; Buvinic and Berger, 1990; Baydas, Meyer and Aguilera-Alfred, 1994; on the contrary there is a lack of such analysis focusing on European countries' situation.

It is well known that the areas mentioned above are characterized by significant sociologic differences, so the evidence found in one area might not be valid in another one.

By this assumption research interests emerge; in this paper we investigate whether female owned firms are discriminated in accessing the credit market in Italy.

We employ data from Bank of Italy Central Credit Register, which provides information on the whole Italian micro enterprises population receiving loans by the Italian banking system.

2. Methodological Approach and Applications

The dataset consists in 390,183 firms that have active loans on December 31st, 2007.

For each of this micro enterprises we possess information about the sex of the owner (SEX), whether it is a bad payer (BAD), the geographical area where the firm is situated (GEO) and finally the sector of economic activity (SEC). In Table 1 we present summary statistics.

Many authors claim that interest rates have little flexibility and therefore this is not the right phenomenon to analyze when looking for discrimination (Peterson, 1981; Duca and Rosenthal, 1994). Moreover, if prejudice is a key factor in denial rates, a logical consequence is that particular groups are forced to meet higher standards to access credit market, then the default rates ought to be lower among discriminated borrowers (Becker, 1957).

Many authors focused on default rates to investigate discrimination phenomenon (see Van Order et al., 1993; and Berkovec et al., 1994).

Considering that we do not possess information about approval or denial decision (every firm listed in Bank of Italy Central Credit Register has already obtained one or more loans), we decided to study the default rates.

The methodology we adopt is the multidimensional logit model with bad debts as response variable and the others as covariates, in symbol

$$\ln\left(\frac{p^*}{1-p^*}\right) = B_0 + B_1SEX + B_2GEO + B_3SEC, \quad [1]$$

where p^* is the expected probability of $BAD=1$, while B_i is the coefficient associated with the j -th determination of the i -th variable.

In particular we are interested in the value assumed by B_i . In fact, let \hat{B}_i denote the estimated B_i . It is well known that the quantity $\exp\left(\hat{B}_i\right)$ represents the multiplicative influence in the odds $\left(\frac{p^*}{1-p^*}\right)$ when the i -th variable assumes the j -th determination compared with the case where the i -th variable assumes the determination taken as base in the estimation process.

After estimating the parameters of [1] using glm procedure in R 2.6.1¹ environment, we found that all the covariates result significant (p value $< 2.2e^{-16}$) for a step wise test.

Considering in more details the resulting estimation it emerges that the less risky firms are farms (estimated coefficient -0.987618) situated in the north east (-0.751526) while the most risky are communication (0.187245) or textile (0.132768) company operating in the south of Italy (0.716244).

Regarding gender, the estimated coefficient associated with the male owners was -0.091749; this means they are 8.8% less risky than the female ones.

Table 1. Italian micro enterprises population having loans with the Italian banks [%]

BAD PAYER	F	M
<i>False</i>	13,02%	52,13%
<i>True</i>	7,48%	27,36%
GEO		
<i>Center</i>	5,64%	18,41%
<i>Islands</i>	2,31%	8,65%
<i>North East</i>	4,35%	19,47%
<i>North West</i>	4,92%	19,63%
<i>South</i>	3,28%	13,33%
SEC		
<i>Chemistry</i>	0,08%	0,32%
<i>Communication</i>	0,03%	0,10%
<i>Construction</i>	0,52%	14,34%
<i>Electric_Supply</i>	0,15%	0,97%
<i>Energy</i>	0,02%	0,16%
<i>Farming</i>	2,12%	10,05%
<i>Food</i>	0,68%	1,90%
<i>Gum_Plastic</i>	0,11%	0,35%
<i>Machinery</i>	0,07%	0,80%
<i>Manufacturing</i>	0,42%	2,89%
<i>Mining</i>	0,15%	1,12%
<i>Office_Supply</i>	0,07%	0,45%
<i>Other_Services</i>	4,19%	11,43%
<i>Publishing</i>	0,18%	0,58%
<i>Textile</i>	1,52%	1,92%
<i>Tourism_Services</i>	1,94%	3,55%
<i>Trade_Services</i>	7,61%	21,03%
<i>Transportation</i>	0,64%	7,54%

Source: Bank of Italy Central Credit Register

3. Discussion and Conclusion

The results obtained by this analysis are quite surprising, in fact it seems that female-owned firms are, not only not discriminated, but facilitated in access credit.

This conclusion is however objectionable, in fact the higher propensity to default emerged in female-owned companies is probably due to other kinds of discriminations.

Difficulties that female entrepreneurs have to face every day in accessing different markets that are still male-dominated.

To definitely clarify whether female entrepreneurs are really discriminated or it is only rhetoric, further analysis investigating the approval / denial process will be necessary. A dedicated survey seems to be the only way. In fact this kind of data are not stored in any public register such as that of the Bank of Italy.

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¹ R is a language and environment for statistical computing and graphics. R is available as Free Software. [Online] available: www.r-project.org

