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(Occasional Papers)

Are female entrepreneurs better payers than men?

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# ARE FEMALE ENTREPRENEURS BETTER PAYERS THAN MEN?

by Daniele Coin*

## Abstract

In this article we test whether Italian female entrepreneurs are more reliable payers than men, by carrying out a survival analysis of micro enterprises that utilize a credit for the first time in the period January 2005 to December 2008, and monitoring the quality of their exposure until December 2010. The data were drawn from the Bank of Italy's Central Credit Register, which provides information on the entire Italian population that has loans with the Italian banking system. We observed that female entrepreneurs are better payers than their male counterparts only because women tend to undertake activities in less risky sectors. Our analysis could also be considered as an indirect measure of whether female entrepreneurs experience discrimination when accessing the Italian credit market.

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* Bank of Italy, Economic Research Unit, Torino Branch.

e-mail: daniele.coin@bancaditalia.it

# 1 Introduction[1]

Micro-enterprises owned by women are a growing share of the western economies (Olson (2005)). A large amount of research, focused mainly on the US (see for example (Bates (1999)), underlined the specificities of these firms, that are often smaller and younger than male-owned ones. Recent studies show that women and minorities owned businesses face constraints in their access to the credit market (see Blanchard *et al.* (2008))[2]. In a recent paper Alesina *et al.* (2008) finnd that in Italy female owned firms pay higher interest rates.

In this paper we compare the refunding debt performances of male and female owned firms. We perform a survival analysis over the micro-enterprises that use a credit for the first time in the period January 2005 - December 2008 monitoring the quality of their exposure until December 2010. We considered "bad payers" firms that hold any amount of loans classified as bad debt by a bank. In this paper we define micro-enterprises as producer households with up to five employees and we employed data from Bank of Italy Central Credit Register, which provides information on the whole Italian population having loans with the Italian banking system, above a certain threshold.

Results are quite surprising. On average female entrepreneurs are better payers than male. This however may be due to the fact that women undertake activities in less risky sectors; controlling for business sector, male-owned firms show present better performances.

Our analysis could be also considered a complementary way to test whether women entrepreneurs are discriminated in accessing the Italian credit market. Some authors suggest that, since interest rates show limited flexibility, they should not be used in searching for discrimination (Peterson (1981); Duca John and Rosenthal Stuart (1993)). But information about approving/denial decisions are not available. In his seminal work on the economics of discrimination, Becker (1971) observed that if prejudice is a key factor in denial rates, then discriminated groups should be forced to meet higher standards to access credit market and hence default rates ought to be lower among discriminated borrowers. In this field many authors have in fact focused on default rates in order to investigate

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[1]A previous version of paper was presented at the conference Women and the Italian Economy organized by the Bank of Italy, held in Rome on March 7th, 2012. The views expressed therein are those of the authors and do not necessarily reflect those of the Bank of Italy.

[2]This phenomenon was investigated especially in North America and in developing countries (see Blanchard *et al.* (2008); Riding Catherine and Allan (1990); Buvinic and Berger (1990); Baydas *et al.* (1994))

discrimination (see Van Order *et al.* (1993) and Berkovec *et al.* (1994)).

The paper is organized as follows. In section 2 we provide description and summary statistics of the data sources employed. Section 3 describes the method adopted to investigate the issue and presents the main results. Concluding remarks are provided in section 4.

# 2  The Data and Summary Statistics

The data used in our analysis are from the Central Credit Register, an information system on the debt of the customers of the banks and financial companies supervised by the Bank of Italy. Banks and financial companies are required to report all their non performing loans and the performing loans above a given amount (75,000 euros until December 2008, 30,000 euros afterwards). The whole population of the micro-enterprises that use any kind of credit for the first time in the period January 2005 - December 2008 is icluded[3]. Thereafter we monitor the quality of their exposure until December 2010 registering if and when they have at least one bad debt. The statistical unit is the firm and not the credit line.

This choice has the two advantages. Firstly we consider firms of comparable age (older firms are more stable than younger ones), that are likely to be young, without a credit history and an entrepreneurial experience: these characteristics should allow to better identify the impact of the variable gender of the entrepreneur at least for this group of companies. Secondly we can consider the time dimension.

Overall, we monitor 148,547 firms (almost 25% are female owned) over five years.

Three relevant informations for any firm $i$ are considered: the first is $\delta_i$, a dummy variable denoting if any firm's credit line deteriorated to bad debt; the second is the firm's observed time of failure (bad debt) or censoring[4], expressed in number of months and denoted with $t_i$; finally the gender of the entrepreneur.

Beyond information on credit deterioration and on gender we use information on the region where the firm is located and on the sector of activity.

In tables 1, 2 and 3 we present summary statistics.

According to table 2, we do not observe wide regional variation. On the contrary (table 3) there are substantial differences on sectors where female firms

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[3]Firms with with bad debts at the registration were excluded.

[4]The censoring time is given by the difference between the registering date and December 2010, the final date of our analysis

are more likely to be active. For example, more than 60 percent of female entrepreneurs run firms in the *Trade sector* and *Other selling services* against 41.5 per cent of the male ones; 9 percent of female firms are active in *Hotel Services* against 4.5 of the male. On the contrary 18.4 percent of male entrepreneurs undertake activities in the *Construction sector* against 2.3 percent only of female ones.

Table 1: Percentages of firms by gender, quality of debt, cohort

|  | Total Population | | | Not Bad Payer | | | Bad Payer | | |
|---|---|---|---|---|---|---|---|---|---|
|  | All | Female | Male | All | Female | Male | All | Female | Male |
| 2005 | 27.31% | 24.82% | 75.18% | 90.53% | 24.88% | 75.12% | 9.47% | 24.31% | 75.69% |
| 2006 | 26.30% | 24.44% | 75.56% | 91.46% | 24.46% | 75.54% | 8.54% | 24.20% | 75.80% |
| 2007 | 26.11% | 25.09% | 74.91% | 92.94% | 25.22% | 74.78% | 7.06% | 23.31% | 76.69% |
| 2008 | 20.29% | 25.81% | 74.19% | 95.40% | 25.93% | 74.07% | 4.60% | 23.14% | 76.86% |
| Total | 100.00% | 24.99% | 75.01% | 92.39% | 25.08% | 74.92% | 7.61% | 23.89% | 76.11% |

Table 2: Percentages of firms by gender, quality of debt, region

|  | Total Population | | | Not Bad Payer | | | Bad Payer | | |
|---|---|---|---|---|---|---|---|---|---|
|  | All | Female | Male | All | Female | Male | All | Female | Male |
| Abruzzi | 3.67% | 26.06% | 73.94% | 91.65% | 26.13% | 73.87% | 8.35% | 25.27% | 74.73% |
| Apulia | 7.15% | 22.86% | 77.14% | 92.57% | 22.99% | 77.01% | 7.43% | 21.17% | 78.83% |
| Calabria | 2.45% | 24.64% | 75.36% | 88.57% | 24.84% | 75.16% | 11.43% | 23.08% | 76.92% |
| Campania | 5.35% | 23.80% | 76.20% | 89.43% | 23.93% | 76.07% | 10.57% | 22.74% | 77.26% |
| Em. Rom. | 9.95% | 24.97% | 75.03% | 93.00% | 25.17% | 74.83% | 7.00% | 22.42% | 77.58% |
| Friuli | 2.29% | 26.52% | 73.48% | 94.56% | 26.43% | 73.57% | 5.44% | 28.11% | 71.89% |
| Latium | 6.36% | 28.18% | 71.82% | 92.43% | 28.04% | 71.96% | 7.57% | 29.89% | 70.11% |
| Liguria | 2.63% | 28.28% | 71.72% | 93.23% | 28.55% | 71.45% | 6.77% | 24.62% | 75.38% |
| Lombardy | 15.65% | 23.24% | 76.76% | 92.42% | 23.48% | 76.52% | 7.58% | 20.33% | 79.67% |
| Marche | 4.68% | 27.70% | 72.30% | 92.38% | 27.79% | 72.21% | 7.62% | 26.60% | 73.40% |
| Piedmont | 8.17% | 25.46% | 74.54% | 91.68% | 25.38% | 74.62% | 8.32% | 26.44% | 73.56% |
| Sardinia | 2.80% | 25.56% | 74.44% | 91.76% | 25.92% | 74.08% | 8.24% | 21.57% | 78.43% |
| Sicily | 7.31% | 25.71% | 74.29% | 89.58% | 25.63% | 74.37% | 10.42% | 26.44% | 73.56% |
| Trentino | 2.80% | 19.55% | 80.45% | 96.63% | 19.51% | 80.49% | 3.37% | 20.71% | 79.29% |
| Tuscany | 8.03% | 28.75% | 71.25% | 92.93% | 29.01% | 70.99% | 7.07% | 25.39% | 74.61% |
| Umbria | 1.76% | 28.82% | 71.18% | 93.75% | 28.82% | 71.18% | 6.25% | 28.83% | 71.17% |
| Veneto | 8.96% | 21.47% | 78.53% | 94.89% | 21.53% | 78.47% | 5.11% | 20.44% | 79.56% |
| Italy | 100.00% | 24.99% | 75.01% | 92.39% | 25.08% | 74.92% | 7.61% | 23.89% | 76.11% |

Table 3: Percentages of firms by gender, quality of debt, sector

| | Total Population | | | Not Bad Payer | | | Bad Payer | | |
|---|---|---|---|---|---|---|---|---|---|
| | All | Female | Male | All | Female | Male | All | Female | Male |
| Agric. | 12.11% | 22.59% | 77.41% | 95.35% | 22.53% | 77.47% | 4.65% | 23.89% | 76.11% |
| Agric. Ind. Mach. | 0.70% | 8.69% | 91.31% | 92.37% | 7.73% | 92.27% | 7.63% | 20.25% | 79.75% |
| Chem. Prod. | 0.41% | 20.43% | 79.57% | 92.03% | 20.40% | 79.60% | 7.97% | 20.83% | 79.17% |
| Comm. Serv. | 0.20% | 26.37% | 73.63% | 89.38% | 27.59% | 72.41% | 10.62% | 16.13% | 83.87% |
| Construction | 14.40% | 3.94% | 96.06% | 87.50% | 3.52% | 96.48% | 12.50% | 6.88% | 93.12% |
| Data Proc. Mach. | 0.55% | 12.78% | 87.22% | 94.35% | 12.11% | 87.89% | 5.65% | 23.91% | 76.09% |
| Elect. Supp. | 0.99% | 12.19% | 87.81% | 91.08% | 11.29% | 88.71% | 8.92% | 21.37% | 78.63% |
| Energ. Prod. | 0.24% | 9.69% | 90.31% | 92.02% | 9.29% | 90.71% | 7.98% | 14.29% | 85.71% |
| Food | 2.73% | 32.06% | 67.94% | 91.85% | 32.00% | 68.00% | 8.15% | 32.73% | 67.27% |
| Gum Plast. Prod. | 0.25% | 26.29% | 73.71% | 88.35% | 24.54% | 75.46% | 11.65% | 39.53% | 60.47% |
| Hotel Serv. | 5.57% | 39.63% | 60.37% | 91.78% | 39.93% | 60.07% | 8.22% | 36.32% | 63.68% |
| Means Trans. | 0.52% | 7.96% | 92.04% | 90.24% | 7.54% | 92.46% | 9.76% | 11.84% | 88.16% |
| Met. Prod. | 1.82% | 9.53% | 90.47% | 89.07% | 8.75% | 91.25% | 10.93% | 15.88% | 84.12% |
| Mineral | 1.01% | 12.95% | 87.05% | 88.91% | 12.85% | 87.15% | 11.09% | 13.77% | 86.23% |
| Not App. | 2.51% | 26.76% | 73.24% | 94.90% | 26.73% | 73.27% | 5.10% | 27.37% | 72.63% |
| Other Ind. Prod. | 2.51% | 14.77% | 85.23% | 91.10% | 14.21% | 85.79% | 8.90% | 20.48% | 79.52% |
| Other Sell. Serv. | 20.59% | 34.03% | 65.97% | 95.45% | 34.09% | 65.91% | 4.55% | 32.66% | 67.34% |
| Publishing | 0.58% | 30.89% | 69.11% | 91.84% | 31.09% | 68.91% | 8.16% | 28.57% | 71.43% |
| Textile Prod. | 2.21% | 48.34% | 51.66% | 89.81% | 48.88% | 51.12% | 10.19% | 43.58% | 56.42% |
| Trade Serv. | 25.67% | 31.54% | 68.46% | 92.39% | 31.41% | 68.59% | 7.61% | 33.16% | 66.84% |
| Trans. Serv. | 4.44% | 8.81% | 91.19% | 90.69% | 8.24% | 91.76% | 9.31% | 14.33% | 85.67% |
| Italy | 100.00% | 24.99% | 75.01% | 92.39% | 25.08% | 74.92% | 7.61% | 23.89% | 76.11% |

# 3   Methodological Approach and Main Results

In order to compare male and female entrepreneurs credit performances we performed a survival analysis of borrowers.

We use two useful functions that describe populations of survival times. The first is the survival function

$$S(t) = P(T > t) \tag{1}$$

where T is a random variable describing firm's solvency time. The second function is the hazard function that can be thought of the instantaneous insolvency rate at time t, among firms who are solvent to that point, and can be written as

$$h(t) = \lim_{\Delta t \to 0} \frac{P\left\{T \in (t, t + \Delta t] \,|\, T > t\right\}}{\Delta t}. \tag{2}$$

The most common estimation method of (1) is the product limit method introduced by Kaplan and Meier (1958). Let $t_{(i)}$ denote an insolvency time associated with $d_i$ insolvencies, with $i = 1, ..., k$. Let $m_i$ be the number of censored firms in the time interval $\left[t_{(i)}, t_{(i+1)}\right]$ and $n_i$ be the number of firms at risk prior to $t_{(i)}$

given by $\sum_{j=1}^{k} (d_j + m_j)$. The Estimated Hazard at Time $t_{(i)}$ is $\widehat{h}_i = \frac{d_i}{n_i}$, the proportion of those at risk just prior to $t_{(i)}$ who fail at time $t_{(i)}$. The estimated Survival Function is given by

$$\widehat{S}(t) = \prod_{i|t_{(i)} \leq t} \left(1 - \widehat{h}_i\right),$$ (3)

where $\widehat{S}(t)$ represents the estimated probability that a firm does not became insolvent beyond time t. In figure 1 we plot the two curves estimated with (3) for male and female entrepreneurs. Figure 1 suggests that female entrepreneurs have better
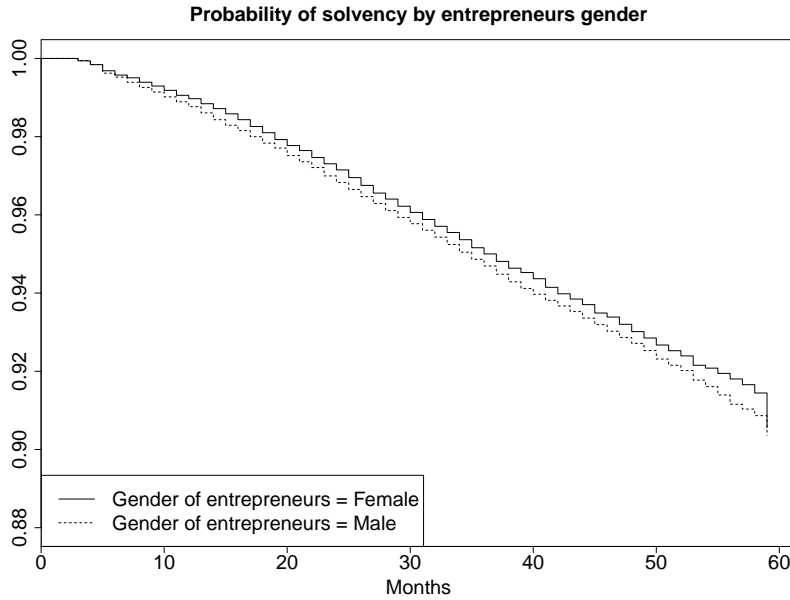


Figure 1: Kaplan Meier curves of the probability of solvency by entrepreneurs gender

performances than male ones. We tested the differences of the two curves by the log rank test proposed by Mantel (1966). The resulting $p$-value is 0.0124 which means that the difference is statistically significant at a level of 0.05.

In order to test the robustness of this result we need to perform a multivariate analysis. Considering $p$ explanatory variables, we denote the relative risk of a firm $i$ with observed levels $x_1, ..., x_p$ as the ratio of its hazard divided by the one of a

firm (called base) with each explanatory variable equal to 0, in symbol:

$$RR_i = \frac{h_i\left(t; x_1, ..., x_p\right)}{h_0\left(t; 0, ..., 0\right)} = \frac{h_i(t)}{h_0(t)}. \tag{4}$$

Hence we estimate the following semiparametric model known as Cox Model introduced by Cox (1972):

$$RR = e^{\boldsymbol{\beta_1} X_1 + ... + \boldsymbol{\beta_p} X_p}. \tag{5}$$

The estimated parameter $e^{\widehat{\beta_j}}$ represents the relative risk of a firm possessing the $j$ level compared with a base level set to zero.

Firstly we estimate model (5) with one regressor using the three variable described in section 2 one by one. In table 4 we present the resulting $p$-values of the overall tests of significant while, in table 5, the estimated coefficient and their associated $p$-values are reported.

Table 4: $p$-values of overall tests

| Covariate | Degrees of Freedom | Likelihood Ratio | Wald | Log rank |
|---|---|---|---|---|
| gender | 1 | 0.01143 | 0.01239 | 0.01237 |
| Region | 16 | 0 | 0 | 0 |
| EconBranch | 20 | 0 | 0 | 0 |

The results reported in table 6 differ from those obtained with the univariate model.

This is due to the lower propensity of women to undertake activities in sectors that registered lower solvency rate in the period of our analysis. As an example consider the Construction sector which our results point out as the one with the highest insolvency rate (see table 3 for example). Only 3.94% of the entrepreneurs are women but they are 6.88% of the bad payers. In order to further investigate this phenomenon we perform another Cox model considering only the covariates Gender, Economic Branch and their interaction. The results are reported in table 7. It is clear that the economic sectors with the highest insolvency rates are those where the interactions with gender are the most significant. In figure 2 we plot the Kaplan Meier curves by gender and the four most risky sectors. In all of them women entrepreneurs show a lower probability of solvency.

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Table 5: Estimated coefficients and $p$-values of univariate models

| Covariates | Levels | $\widehat{\beta}$ | $\exp\left(\widehat{\beta}\right)$ | $p$-values |
|---|---|---|---|---|
| gender | Female | base | base | base |
| | Male | 0.0552 | 1.0567 | 0.0124 |
| Region | Abruzzi | base | base | base |
| | Apulia | -0.1207 | 0.8863 | 0.0404 |
| | Calabria | 0.3382 | 1.4024 | $< 0.001$ |
| | Campania | 0.2473 | 1.2806 | $< 0.001$ |
| | Em. Rom. | -0.2120 | 0.8090 | 0.0002 |
| | Friuli | -0.4676 | 0.6265 | $< 0.001$ |
| | Latium | -0.1140 | 0.8922 | 0.0572 |
| | Liguria | -0.2512 | 0.7779 | 0.0012 |
| | Lombardy | -0.1201 | 0.8868 | 0.0224 |
| | Marche | -0.1190 | 0.8878 | 0.0626 |
| | Piedmont | -0.0192 | 0.9810 | 0.7341 |
| | Sardinia | 0.0042 | 1.0042 | 0.9529 |
| | Sicily | 0.2335 | 1.2630 | $< 0.001$ |
| | Trentino | -0.9599 | 0.3829 | $< 0.001$ |
| | Tuscany | -0.1987 | 0.8198 | 0.0006 |
| | Umbria | -0.3262 | 0.7217 | 0.0004 |
| | Veneto | -0.5333 | 0.5867 | $< 0.001$ |
| Economic Branch | Agric. | base | base | base |
| | Agric. Ind. Mach. | 0.5202 | 1.6824 | $< 0.001$ |
| | Chem. Prod. | 0.6129 | 1.8458 | $< 0.001$ |
| | Comm. Serv. | 0.9058 | 2.4740 | $< 0.001$ |
| | Construction | 1.0512 | 2.8610 | $< 0.001$ |
| | Data Proc. Mach. | 0.2146 | 1.2394 | 0.1565 |
| | Elect. Supp. | 0.6954 | 2.0045 | $< 0.001$ |
| | Energ. Prod. | 0.6070 | 1.8348 | 0.0016 |
| | Food | 0.6102 | 1.8408 | $< 0.001$ |
| | Gum Plast. Prod. | 0.9517 | 2.5901 | $< 0.001$ |
| | Hotel Serv. | 0.5973 | 1.8172 | $< 0.001$ |
| | Means Trans. | 0.7922 | 2.2083 | $< 0.001$ |
| | Met. Prod. | 0.9076 | 2.4783 | $< 0.001$ |
| | Mineral | 0.9289 | 2.5318 | $< 0.001$ |
| | Not App. | 0.1548 | 1.1674 | 0.0541 |
| | Other Ind. Prod. | 0.6890 | 1.9916 | $< 0.001$ |
| | Other Sell. Serv. | 0.0056 | 1.0056 | 0.8988 |
| | Publishing | 0.5994 | 1.8210 | $< 0.001$ |
| | Textile Prod. | 0.8318 | 2.2974 | $< 0.001$ |
| | Trade Serv. | 0.5220 | 1.6854 | $< 0.001$ |
| | Trans. Serv. | 0.7487 | 2.1142 | $< 0.001$ |

Table 6: Estimated coefficients and $p$-values of multivariate model

| Covariate | Levels | $\widehat{\beta}$ | $\exp\left(\widehat{\beta}\right)$ | $p$-values |
|---|---|---|---|---|
| gender | Female | base | base | base |
| | Male | -0.1164 | 0.89012 | < 0.001 |
| Region | Abruzzi | base | base | base |
| | Apulia | -0.0838 | 0.9196 | 0.1547 |
| | Calabria | 0.3495 | 1.4184 | < 0.001 |
| | Campania | 0.2858 | 1.3309 | < 0.001 |
| | Em. Rom. | -0.2362 | 0.7897 | < 0.001 |
| | Friuli | -0.4900 | 0.6126 | < 0.001 |
| | Latium | -0.0429 | 0.9580 | 0.4749 |
| | Liguria | -0.2902 | 0.7482 | 0.0002 |
| | Lombardy | -0.1650 | 0.8479 | 0.0017 |
| | Marche | -0.1173 | 0.8893 | 0.0665 |
| | Piedmont | -0.0476 | 0.9535 | 0.3996 |
| | Sardinia | 0.0319 | 1.0324 | 0.6560 |
| | Sicily | 0.2761 | 1.3180 | < 0.001 |
| | Trentino | -0.8876 | 0.4117 | < 0.001 |
| | Tuscany | -0.2201 | 0.8025 | 0.0002 |
| | Umbria | -0.3433 | 0.7094 | 0.0002 |
| | Veneto | -0.5494 | 0.5773 | < 0.001 |
| Economic Branch | Agric. | base | base | base |
| | Agric. Ind. Mach. | 0.5659 | 1.7610 | < 0.001 |
| | Chem. Prod. | 0.6388 | 1.8942 | < 0.001 |
| | Comm. Serv. | 0.9012 | 2.4626 | < 0.001 |
| | Construction | 1.0956 | 2.9910 | < 0.001 |
| | Data Proc. Mach. | 0.2054 | 1.2280 | 0.1753 |
| | Elect. Supp. | 0.7177 | 2.0498 | < 0.001 |
| | Energ. Prod. | 0.6490 | 1.9137 | 0.0007 |
| | Food | 0.5479 | 1.7296 | < 0.001 |
| | Gum Plast. Prod. | 0.9478 | 2.5800 | < 0.001 |
| | Hotel Serv. | 0.6030 | 1.8276 | < 0.001 |
| | Means Trans. | 0.7882 | 2.1995 | < 0.001 |
| | Met. Prod. | 0.9419 | 2.5648 | < 0.001 |
| | Mineral | 0.9009 | 2.4618 | < 0.001 |
| | Not App. | 0.1469 | 1.1582 | 0.0680 |
| | Other Ind. Prod. | 0.7172 | 2.0486 | < 0.001 |
| | Other Sell. Serv. | -0.0131 | 0.9870 | 0.7666 |
| | Publishing | 0.5717 | 1.7713 | < 0.001 |
| | Textile Prod. | 0.8052 | 2.2371 | < 0.001 |
| | Trade Serv. | 0.4695 | 1.5992 | < 0.001 |
| | Trans. Serv. | 0.7825 | 2.1870 | < 0.001 |

Table 7: Estimated coefficients and $p$-values of multivariate model with interaction

| Covariate | Levels | $\widehat{\beta}$ | $\exp\left(\widehat{\beta}\right)$ | $p$-values |
|---|---|---|---|---|
| Gender | Female | base | base | base |
| | Male | -0.0846 | 0.9189 | 0.2969 |
| Economic Branch | Agric. | base | base | base |
| | Agric. Ind. Mach. | 1.2741 | 3.5754 | < 0.001 |
| | Chem. Prod. | 0.5893 | 1.8027 | 0.0690 |
| | Comm. Serv. | 0.3553 | 1.4266 | 0.4326 |
| | Construction | 1.6247 | 5.0768 | < 0.001 |
| | Data Proc. Mach. | 0.7712 | 2.1623 | 0.0128 |
| | Elect. Supp. | 1.2614 | 3.5304 | < 0.001 |
| | Energ. Prod. | 0.9917 | 2.6959 | 0.0495 |
| | Food | 0.5748 | 1.7769 | < 0.001 |
| | Gum Plast. Prod. | 1.3124 | 3.7151 | < 0.001 |
| | Hotel Serv. | 0.4411 | 1.5543 | < 0.001 |
| | Means Trans. | 1.1547 | 3.1732 | 0.0007 |
| | Met. Prod. | 1.3704 | 3.9371 | < 0.001 |
| | Mineral | 0.9045 | 2.4707 | < 0.001 |
| | Not App. | 0.1259 | 1.1342 | 0.4187 |
| | Other Ind. Prod. | 0.9847 | 2.6771 | < 0.001 |
| | Other Sell. Serv. | -0.0941 | 0.9102 | 0.2672 |
| | Publishing | 0.4524 | 1.5721 | 0.0537 |
| | Textile Prod. | 0.6510 | 1.9175 | < 0.001 |
| | Trade Serv. | 0.5127 | 1.6698 | < 0.001 |
| | Trans. Serv. | 1.2362 | 3.4424 | < 0.001 |
| Interaction | Agric. * Male | base | base | base |
| | Agric. Ind. Mach. * Male | -0.8671 | 0.4202 | 0.0029 |
| | Chem. Prod. * Male | 0.0327 | 1.0332 | 0.9286 |
| | Comm. Serv. * Male | 0.6983 | 2.0103 | 0.1583 |
| | Construction * Male | -0.5881 | 0.5554 | < 0.001 |
| | Data Proc. Mach. * Male | -0.6728 | 0.5103 | 0.0581 |
| | Elect. Supp. * Male | -0.6661 | 0.5137 | 0.0035 |
| | Energ. Prod. * Male | -0.4237 | 0.6546 | 0.4378 |
| | Food * Male | 0.0409 | 1.0418 | 0.7742 |
| | Gum Plast. Prod. * Male | -0.5454 | 0.5796 | 0.0906 |
| | Hotel Serv. * Male | 0.2319 | 1.2610 | 0.0414 |
| | Means Trans. * Male | -0.3886 | 0.6780 | 0.2859 |
| | Met. Prod. * Male | -0.5178 | 0.5958 | 0.0037 |
| | Mineral * Male | 0.0377 | 1.0384 | 0.8745 |
| | Not App. * Male | 0.0353 | 1.0359 | 0.8461 |
| | Other Ind. Prod. * Male | -0.3513 | 0.7038 | 0.0265 |
| | Other Sell. Serv. * Male | 0.1366 | 1.1464 | 0.1683 |
| | Publishing * Male | 0.2014 | 1.2231 | 0.4668 |
| | Textile Prod. * Male | 0.3000 | 1.3499 | 0.0283 |
| | Trade Serv. * Male | 0.0024 | 1.0024 | 0.9785 |
| | Trans. Serv. * Male | -0.5365 | 0.5848 | 0.0001 |

13
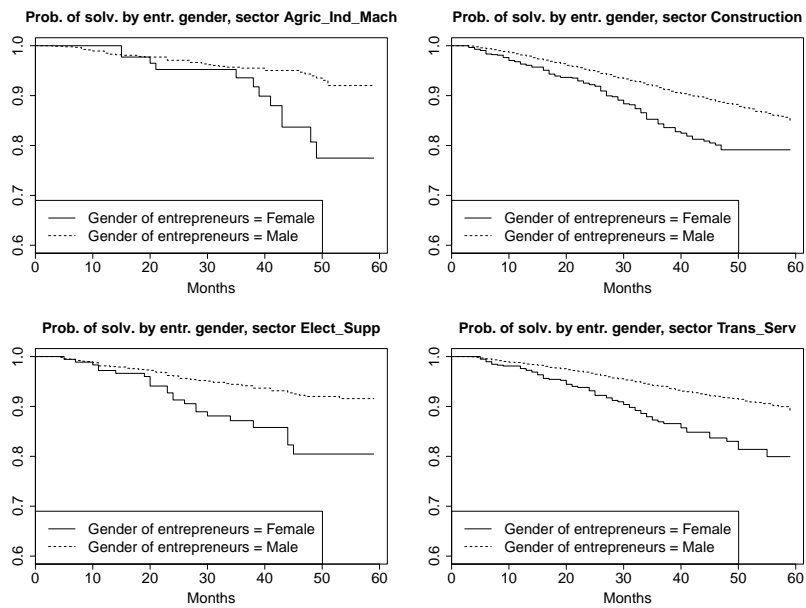
Figure 2: Kaplan Meier curves of the probability of solvency by entrepreneurs gender and the most risky sectors

# 4   Concluding Remarks

In this paper an analysis of refunding debts performances of male and female owned small firms was performed. Results show that greater presence of women entrepreneurs in less risky sectors determines their overall better performance in refunding debts. On the other hand if we control for the economic sector it seems that men are better payers.

If we accept the interpretation of Becker (1971) that discriminated groups are forced to meet higher standards to access credit market, then women entrepreneurs do not appear to be discriminated on the credit market. However in order to definitely clarify if women entrepreneurs are discriminated, further analysis investigating the approval/denial process phenomenon would be necessary (see the paper by Stefani and Vacca (2013) for a similar analysis).

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