

Garcia-Tabuenca, Antonio; Pablo-Martí, Federico; Crecente-Romero, Fernando

Conference Paper

Female entrepreneurship and SMEs: Changes in access to credit and business results?

55th Congress of the European Regional Science Association: "World Renaissance: Changing roles for people and places", 25-28 August 2015, Lisbon, Portugal

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Garcia-Tabuenca, Antonio; Pablo-Martí, Federico; Crecente-Romero, Fernando (2015) : Female entrepreneurship and SMEs: Changes in access to credit and business results?, 55th Congress of the European Regional Science Association: "World Renaissance: Changing roles for people and places", 25-28 August 2015, Lisbon, Portugal, European Regional Science Association (ERSA), Louvain-la-Neuve

This Version is available at:

<https://hdl.handle.net/10419/124640>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Female entrepreneurship and SMEs. Changes in access to credit and business results?

Authors:

Antonio García Tabuena (antonio.gtabuena@uah.es)

Federico Pablo Martí (federico.pablo@uah.es)

Fernando Crecente Romero (fernando.crecente@uah.es)

University of Alcalá (Madrid)

Introduction

The influence of women on entrepreneurial activity and company ownership has assumed greater importance in recent decades. Until well into the 1970s academic research paid little attention to this phenomenon, one still in its infancy. Since then there has been a progressive increase in the study of women who take the decision to enter the market as heads and managers of businesses. The analysis of the differences in behaviour between male and female entrepreneurs is one which has generated most literature (Schwartz, 1976; Hisrich and Brush, 1983; Loscocco et al., 1991; Verheul, 2005, among others).

There are currently important initiatives dedicated systematically to such research, the Diana Project (2015) being one of the most important. It was established in 1999 by a group of female teachers close to Babson College and the ESBRI in Stockholm. Its objective is to share a global research agenda regarding female entrepreneurs and their growth-oriented companies. It is recognised that this establishment of businesses owned by women is an important source of the creation of wealth, employment and economic development. Tracking this project and its publications permits being up to date with the evolution of this field and the new contributions to it.

Governments and international economic organisations (OECD, 2004; European Commission, 2008) have also developed policies and programmes aimed at favouring the entry of women into businesses and business management. In general, the assessment of these projects of a public nature have been positive. Yet they also reflect the fact that the incentives provided often serve more to extend the importance of the social phenomenon of the female entrepreneur than to increase the relative weight of new women-owned companies (Carter and Shaw, 2006).

In general, research has principally concentrated on five subjects: i) the characteristics and motivations for entering into entrepreneurial activity (Brush and Hisrich, 1991; Pablo-Martí et al., 2014), ii) the strategic choice of women in adopting the decision to start up a business (Verheul et al., 2008), iii) the role of leadership (Schwartz, 1976; Justo et al. 2006), iv) the barriers to entry and factors hindering entrepreneurial activity (Brush and Gatewood, 2008), principally the access to funding (Klapper and Parker, 2010), and v) the performance and results achieved (Coleman and Robb, 2009; Díaz and Jiménez, 2010; Crespo-Espert et al., 2012). These topics have been exhaustively studied, although further research in this field is required.

The present study, of the Spanish economy and, in particular, its SME framework, is centred on the last two subjects cited. That is to say, on the one hand a study is made of the obstacles to entry for the entrepreneurial activity of women, with particular emphasis on access to the finance and credit necessary to tackle or consolidate their investment initiative. On the other hand, the performance achieved by their companies are examined. Together with these results other complementary variables are presented and analysed, and both are compared with those derived from the entrepreneurial initiatives of males. The study period is of interest, as it covers the years from 2003, in the midst of the expansionary phase (and of the bubble) of the economy, to 2013, following the emergence of the crisis and the profound and long recession. Thus, some ideas and conclusions can be extracted for a period which covers almost a complete economic cycle.

The study focuses on a panel of 23,504 companies, of which 3,262 are directed by female managers, and another 20,242 by males, also shareholders. The panel permits the division of the economic-financial variables, in accordance with three analytical criteria: business size (employment), sectors (eight large branches of activity) and company location (in accordance with NUTS-1¹ regions). It is therefore a wide set of companies which offers complete economic information concerning two indicators –debt and economic profitability- for the eleven years of the study. Only 1.42% of the total are large businesses, and the companies in the panel are therefore basically SMEs. This configuration facilitates the analysis of gender differences.

Given this description, the study has three sections, in addition to this introduction. The second presents the information sources and the analytical method employed. The third section presents and comments upon the results, while the fourth extracts the principal conclusions and offers some suggestions for the orientation of new policies in the sphere of female entrepreneurs.

2. Information sources and method

The SABI database has been employed in the study; this gathers information from Spanish firms which are obliged to annually present their balance sheets and income statements in the official mercantile registers. SABI has available information from companies in Spain and Portugal. The AMADEUS database offers similar characteristics for a considerable proportion of firms in European countries.

In the 2015 version, this database provides information on 1,361,523 Spanish businesses which have legal form (limited companies and public limited companies), of which at the time of extraction there were 783, 818. When for the period 2003-2013 (the last year to offer complete information) the restriction is imposed that all companies have available data which permit the ratios of indebtedness and economic profitability to be obtained, the number of firms drops to 206,893. Finally, the condition is added that the director of the company bear the title of General Director or CEO, in addition to being shareholders. With these characteristics in common, the final set is comprised of

¹ NUTS-1 are homogeneous territorial divisions or regions in the EU, constituted by EUROSTAT.

3,262 companies directed and owned (totally or partially) by women and 20,242 directed and owned by men. 98.6% of the total are SMEs: only 31 female-owned companies and 303 male-owned firms are large companies. Table 1 presents the description of the panel of businesses studied, as well as their representation with regard to the data provided by the Spanish economy to the DIRCE-INE (2015).

This panel is not therefore truly representative of the Spanish company structure, but instead of the set of companies on the basis of which complete information (officially required by the mercantile registers) is available. This includes, among other data, those which permit the calculation of the two indicators selected: indebtedness and economic profitability. Apparently, therefore, it concerns the set of Spanish companies with a better or greater degree of informational transparency, at least from the perspective of compliance with the mercantile register obligations. This also permits the assumption that they are expanding companies, although this supposition must be tested against the average of the economy (control group).

This circumstance is of interest to the research. On the one hand, because the data extracted and the results obtained from the analysis of the panel reflect quite rigorously the behaviour of companies in the period studied, which in addition have suffered a long recessionary stage of the economy, with a sharp drop in internal demand and strong credit restrictions. On the other hand, because the comparison of the two subgroups studied -female and male businesspeople -is also more precise and less approximate, as may occur in other studies regarding gender. For example, in those which employ surveys or registers having insufficient statistical representativeness. And thirdly, because despite these methodological warnings the group studied comprises over 23,000 observations, which gives consistency to the analysis.

In conclusion, the panel studied, although robust in its extension and typology of companies, offers behaviour and results from the companies comprising it, adjusted to their own characterisation. But these do not necessarily coincide with the business average, not even if discrimination is performed by gender. Even so, it offers a reference framework for the Spanish business structure, and even includes the perspectives of size, sector and regional localisation.

Specifically, it should be observed that, by business size, participation in the distribution of the panel of male-female companies is very different to that offered by the average of the economy through the data from the DIRCE-INE (2015). In 2013, the DIRCE showed that 85.9% of companies (of a mercantile nature and with employees) are micro companies; 11.3% are small; 1.8%, medium-sized, and 0.5%, are large. In the panel of the current study the participation of microfirms is much lower, 16.2%; small companies account for 68.9%; medium-sized firms for 13.5%, and large companies represent 1.2%.

The sample/panel is therefore biased towards greater sizes, principally because microfirms have very little weight, while small and medium companies attain much greater weight than the average value of the DIRCE. It is reasonable to assume that the

principal reason for this bias is based on a supposedly negative relationship between lower levels of informational transparency and company size.

Similarly, within firms in the panel, it can be observed that the greatest difference with regard to participation by gender is found in the group of microfirms run by women, which are much greater than those managed by men (24.1% compared to 14.9%). The other strata are reasonably balanced.

Table 1. **Panel of male and female companies, SABI database, and participation in DIRCE (companies with employees), year 2013**

| Size (employment) | Women | | Men | | DIRCE |
|---------------------------|--------------|------------|---------------|------------|-------------|
| | number | % | number | % | % |
| Microfirms (< 10 workers) | 786 | 24.1 | 3,025 | 14.9 | 85.9 |
| Small (10 to 49) | 2,064 | 63.3 | 14,129 | 69.8 | 11.3 |
| Medium (50-249) | 381 | 11.7 | 2,785 | 13.8 | 1.8 |
| Large (> 250) | 31 | 1.0 | 303 | 1.5 | 0.5 |
| Total | 3,262 | 100 | 20,242 | 100 | 100 |

| Sector (CNAE 2009) | | | | | |
|--|--------------|------------|---------------|------------|-------------|
| Agricultural and extractive industries (1-9) | 86 | 2.6 | 529 | 2.6 | 8.5 |
| Industry (10-39) | 837 | 25.7 | 5,604 | 27.7 | |
| Construction (41-43) | 303 | 9.3 | 2,785 | 13.8 | 10.8 |
| Distribution and commercial services (45-47) | 955 | 29.3 | 5,858 | 28.9 | 26.3 |
| Transport and comms. (49-53 y 57-62) | 214 | 6.6 | 1,619 | 8.0 | 6.3 |
| Accommodation and tourism (55-56) | 224 | 6.9 | 1,016 | 5.0 | 12.3 |
| Services to companies (63-82) | 452 | 13.9 | 2,102 | 10.4 | 20.5 |
| Services to persons (85-99) | 191 | 5.9 | 729 | 3.6 | 15.3 |
| Total | 3,262 | 100 | 20,242 | 100 | 100 |

| Localisation (NUTS-1) | | | | | |
|-------------------------------------|--------------|------------|---------------|------------|-------------|
| Madrid region | 604 | 18.5 | 3,905 | 15.3 | 14.5 |
| East region | 1,275 | 39.1 | 7,608 | 37.6 | 31.3 |
| South region (incl. Canary Islands) | 444 | 13.6 | 3,125 | 15.4 | 22.8 |
| Centre region | 314 | 9.06 | 2,172 | 10.7 | 11.3 |
| Northwest region | 284 | 8.7 | 1,943 | 9.6 | 9.8 |
| Northeast region | 341 | 10.5 | 2,299 | 11.4 | 10.2 |
| Total | 3,262 | 100 | 20,242 | 100 | 100 |

Source: Authors' compilation, from SABI and DIRCE (INE)

However, with regard to sectors and the regional localisation of companies, the imbalances are lower than for sizes. Nevertheless, by sectors, there is considerable inequality between those belonging to the industrial (and extractive) sector, with over triple the weight in the panel than in the DIRCE (30% as against 11.1%). This magnitude leads to the assumption that industrial companies (present in the panel) are more transparent, due to their more competitive nature. In the construction sectors and commercial distribution services inequalities are low, and in the remaining services (transport, accommodation and tourism, services to companies and to persons) the

opposite to industry occurs, that is to say, participation in the panel is much lower (27.9%) than that of the DIRCE (54.4%). In turn, the relative participation of men and women within the panel is reasonably balanced.

With regard to localisation, the only notable feature is the greater participation of the panel companies in the Eastern region and the lower participation in those of the Southern region, compared to those of the DIRCE.

Elsewhere, together with these panel data there is also included a group of companies representing the average of the economy, by way of a control group. This sample is based on the set of companies with employees in the SABI database, without distinguishing the gender of company owners, nor requiring that each observation has complete data, at least for two of the variables indicated (economic profitability and indebtedness). In this way, a temporary tracking may be performed, at least approximately, of the behaviour and evolution of the variables used in the panel with regard to those of the control group.

The study of the behaviour of companies according to gender (male-female) has been performed from two perspectives. The first is through an examination of financial-economic indicators and their graphical analysis. Concretely, the following indicators have been obtained: a) indebtedness ratio (the value of the debt with regard to the value of the asset), b) economic profitability (profit before interest and taxes divided by the value of the asset), c) financial profitability (net profit per unit of equity), d) EBITDA over assets (profit before the payment of interests, taxes, depreciation and amortization divided by the value of the asset), and e) productivity (measured in euros of net profit–in place of added value per worker).

Similarly, due to the great interest it has for the present study, use is made of the indicator of ‘bank credit over assets’. This indicator cannot be obtained for all companies in the panel because there is information only for the 41% of them and, furthermore, bank credit is only reflected from 2007 on, from when it was required by the new accounting norms in the presentation of non-abbreviated accounting statements.

Whatever the case, the indicator of indebtedness is employed in the study as a proxy of banking credit over assets, since it is assumed that indebtedness consists of two principal components: debt with suppliers and external credit (almost always banking debt but it may also be of non-banking origin, for example family loans). We assume that debt with suppliers behaves similarly between female and male entrepreneurs. In the calculations of the indicators the statistical mean has been used.

The second perspective of the analysis includes a Probit model applied to the panel in which the dependent variable is dichotomic. It takes the value of 0 or 1 depending on whether the observation is of a female or male businessperson, respectively. The exogenous variables are the rate of indebtedness, economic profitability, financial profitability and productivity (profit per employee), and the dummy variables are considered to be the six NUTS1 regions, the four company sizes and the eight sectors of activity chosen. For these purposes an ad hoc database has been elaborated with the set

of economic-financial indicators described and the group of dummy variables which facilitate analysis on the basis of the size, sector and regional localisation of companies.

In a previous analysis it was observed that the exogenous EBITDA variables over assets and productivity display strong correlations with economic profitability, and thus they are excluded. Financial profitability with regard to economic profitability displays a degree of correlation inferior to 0.4, and consequently it is kept as a variable in the model.

Thus, the variables are:

Independent variables:

- debt: indebtedness ratio –proxy of bank credit–
- eco_prof: economic profitability
- fin_profit: financial profitability

Dummy variables:

- micro: micro enterprises (less than 10 employees)
- small: small enterprises (10-49 employees)
- medium: medium enterprises (50-249 employees)

With regard to the four company sizes adopted, large companies are taken as reference.

- agric: companies in agriculture and extractive
- construct: companies in the construction sector
- comm_distr: distribution and commercial services (wholesale and retail firms)
- trans&comms: transport and communications companies
- accom&tour: hospitality and tourism industry companies
- buss_serv: services to companies.
- pers_serv: personal services companies.

With regard to the eight sectors of companies adopted, the industrial sector is taken as reference.

- crisis: dichotomic variable: 0 if before the crisis and 1 for the years of the crisis.
- NUTS1: Madrid; companies located in the region of Madrid.
- NUTS2: East; companies located in Catalonia, Valencia and the Balearic Islands.
- NUTS3: South; companies located in Andalusia, Murcia and the Canary Islands.

- NUTS4: Centre; companies located in Castile and Leon, Castile-La Mancha and Extremadura.
- NUTS5: Northwest; companies located in Galicia, Asturias and Cantabria.
- NUTS6: companies located in the Basque Country, La Rioja, Navarre and Aragon.

With regard to the six NUTS1 regions, the region of Madrid is taken as reference.

3. Results

3.1 Study of economic-financial indicators

From the study of economic-financial indicators and graphical analysis it is clear that during the study period (2003 to 2013), through which runs a crucial part of the expansionary cycle of the Spanish economy (1996 to 2007) and another (2008 to 2013) from the onset of the crisis until its deepening and recessions from 2009 and 2011-12, male-owned companies show, in general, better performance than those belonging to women (Graph 1 to 5).

In all cases, the upward trend of the indicators in the phase of expansion collapses from 2007 on; even debt is anticipated in this fall to the year 2006. 2013 shows a modest recovery in all the indicators with the exception of indebtedness and credit over assets.

Nevertheless, the male-female differences are greater in the indicators of indebtedness and bank credit over assets -elsewhere lower in the final years of the crisis-, than in the indicators of productivity and results (profit per employee, economic profitability, financial profitability). In the last of these, even finding the values returned by female-controlled companies in all the years of the period to be lower than those of men, the difference is lower, and even very small. Only in the ratio of financial profitability do the values become somewhat more distant, above all in the period prior to the crisis.

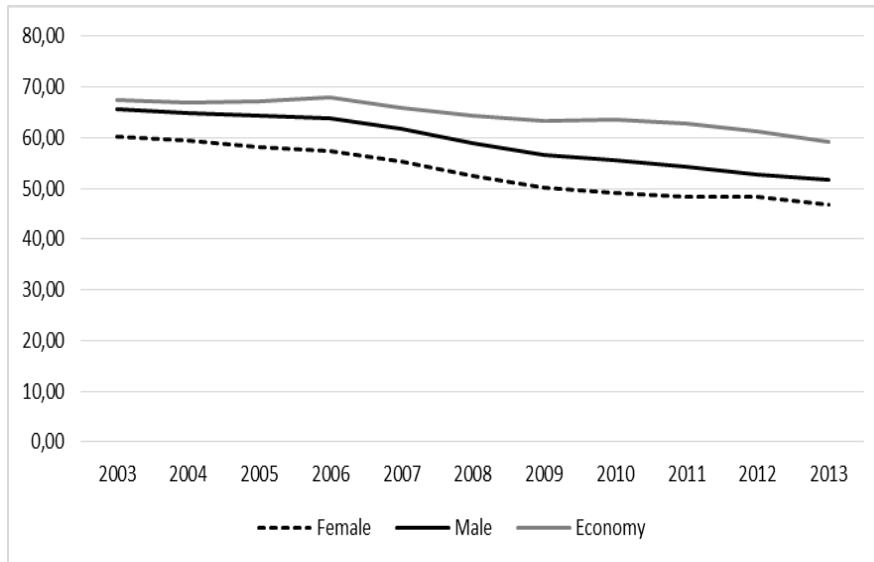
In short, there is lower external debt (less credit) on the part of firms controlled by women but their results are not very distant with regard to those managed by men.

This apparently discordant economic behaviour could be explained by taking into account, among other factors, the smaller relative size of female-run companies (more micro-firms and fewer companies of the remaining sizes), and also the sectors in which they operate, with greater or lesser competitiveness expected (industry and services to companies compared to accommodation and tourism or services to persons). The econometric estimation developed in the study permits advances to be made in the clarification of these factors.

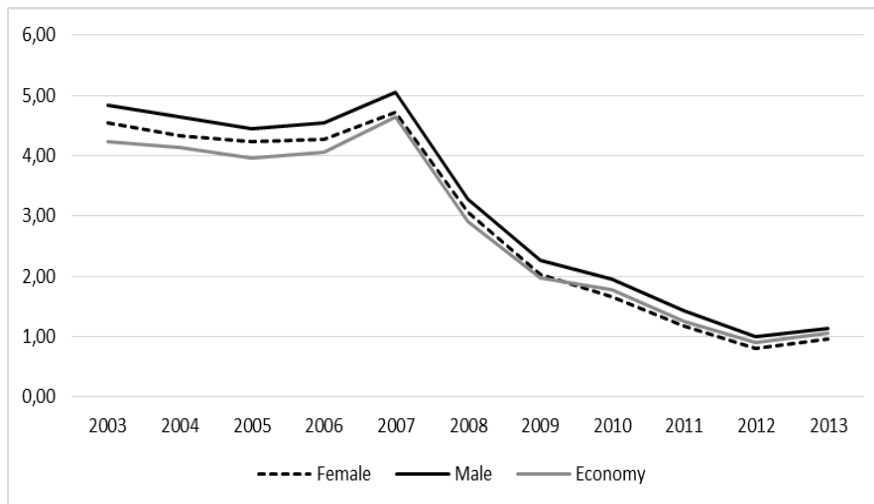
In turn, the control group evolves with values somewhat higher in indebtedness and bank credit over assets, and displays varied behaviour in the indicators of results. On the one hand, profit per employee is approximately between one and one and a half percentage points lower than that of the companies in the panel in the expansionary

phase of the economy, while the difference was progressively reduced and almost converged in the crisis phase. On the other, it is striking that the values of financial profitability are positioned above those of the panel, the difference widening in the last years of the crisis. This could be explained (in a crisis) because business managers are more concerned with increasing the benefit to its shareholders or owners.

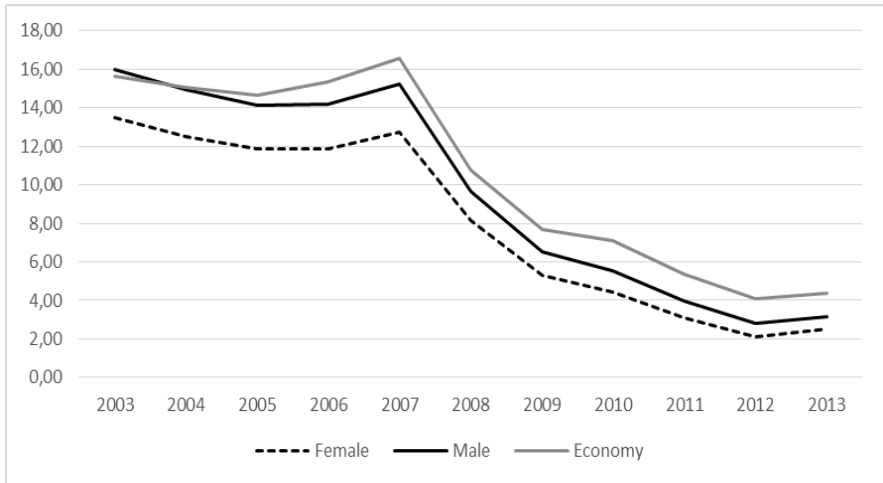
Graph 1. **Indebtedness, %**



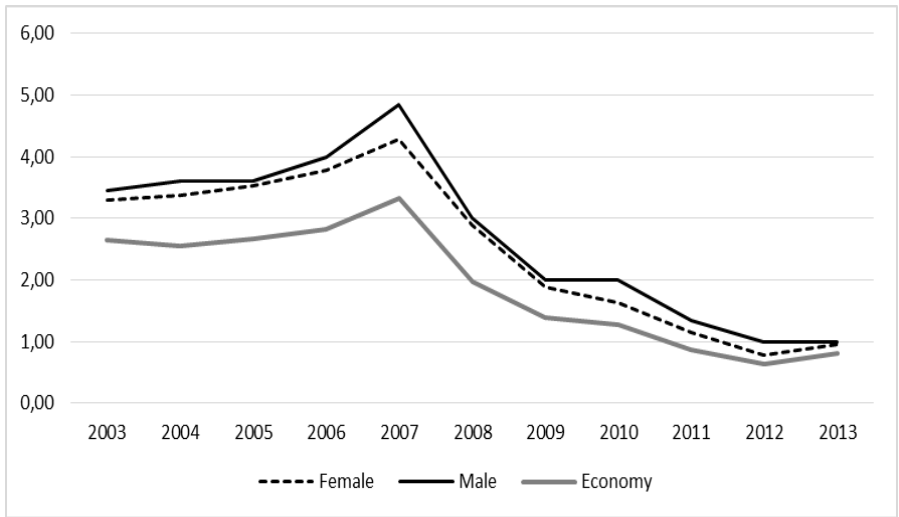
Graph 2. **Economic profitability, %**



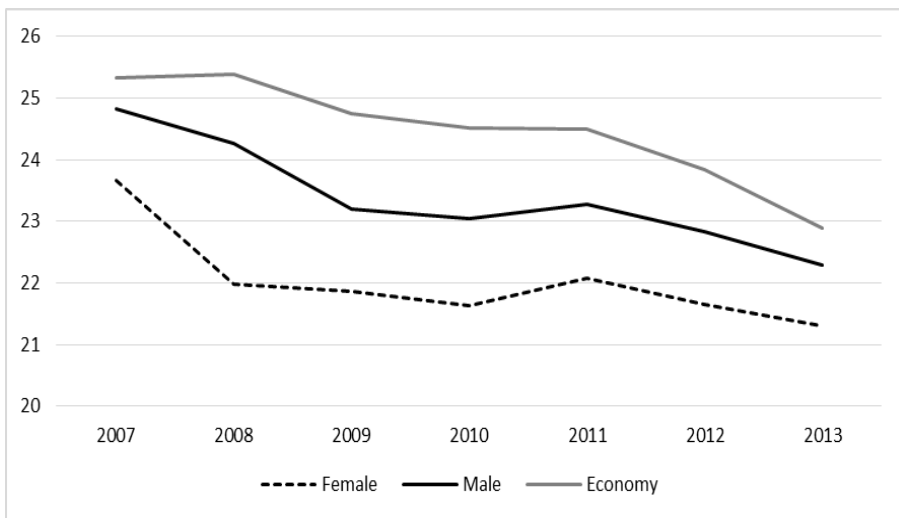
Graph 3. Financial profitability, %



Graph 4. Net profit per employee, thousands of euros



Graph 5. Bank credit over assets (*)



(*) Only for companies having information available

3.2 Relative positioning of female-owned business

Together with this graphical study has been made another quantitative analysis, calculating the average values of the indicators of indebtedness and the results of women-owned businesses compared to those run by men. In this way can be obtained an indicator of business positioning regarding gender (Table 2). In this regard, the average value by period (2003-2007 and 2008-2013) between the results of the principal financial-economic indicators employed in the study -indebtedness, profitability, productivity and credit/assets- of women-owned companies less those corresponding to male-run firms, and this difference has been divided by the results of the same indicator of male-managed businesses. A negative sign signifies a worse performance of a female-run company with regard to that of a male-owned firm. For example, in the case of indebtedness:

$$\text{Positioning of female indebtedness} = [\Sigma(f_c) - \Sigma(m_c)] / \Sigma(m_c)$$

This calculation has been made for the three segmentations performed in the analysis: NUTS1, business size and sectors.

Table 2. Results for women-run businesses, position regarding male-run companies, by regions, sizes and sectors, in the periods 2003-2007 and 2008-2013, in percentages

| | Indebtedness | | Economic profitability | | Financial profitability | | Productivity | | Credit /Assets |
|--------------------------------------|--------------|-----------|------------------------|-----------|-------------------------|-----------|--------------|-----------|----------------|
| | 2003/2007 | 2008/2013 | 2003/2007 | 2008/2013 | 2003/2007 | 2008/2013 | 2003/2007 | 2008/2013 | 2008/2013 |
| NUTS regions: | | | | | | | | | |
| Madrid region | -11.85 | -9.42 | -17.48 | -14.23 | -22.39 | -24.36 | -19.70 | -9.84 | -12.18 |
| East region | -9.77 | -7.66 | -9.16 | -5.47 | -15.94 | -12.67 | -14.55 | -11.00 | -0.17 |
| South region (+Canaries) | -7.14 | -7.55 | -20.23 | -6.48 | -23.43 | -19.82 | -8.55 | 5.18 | -10.43 |
| Centre region | -14.29 | -15.72 | 0.28 | 8.76 | -19.53 | -15.09 | 1.17 | 6.52 | -9.61 |
| Northwest region | -5.88 | -8.26 | -26.76 | -13.13 | -27.38 | -15.72 | -12.48 | -3.30 | -1.70 |
| Northeast region | -11.52 | -10.20 | -3.61 | -3.40 | -13.18 | -14.25 | -15.59 | -8.04 | -9.67 |
| Company size: | | | | | | | | | |
| Microfirms | -21.22 | -20.14 | 15.03 | -5.22 | -10.78 | -25.43 | 72.32 | 37.74 | -4.08 |
| Small | -8.44 | -7.16 | -8.71 | -3.17 | -12.11 | -10.77 | -8.97 | -8.54 | -9.58 |
| Medium | -1.74 | -5.43 | -6.67 | -6.04 | -0.97 | -2.77 | -44.09 | -39.03 | 1.21 |
| Large | 1.80 | 4.53 | -16.48 | -23.79 | -10.35 | -30.96 | -45.74 | -57.59 | 8.60 |
| Sectors of activity: | | | | | | | | | |
| Agricultural and extractive | -6.85 | -11.37 | 34.77 | -22.49 | 20.15 | -26.95 | 59.20 | -0.36 | -16.48 |
| Industry | -8.48 | -6.97 | -7.69 | -1.79 | -11.53 | -5.55 | -12.33 | -7.27 | -11.18 |
| Construction | -16.89 | -14.44 | -15.13 | -5.38 | -30.81 | -21.53 | 19.16 | 40.95 | -3.48 |
| Distribution and commercial services | -7.10 | -6.20 | -17.91 | -3.76 | -23.16 | -12.41 | -17.20 | -7.18 | -10.99 |
| Transport and communications. | -4.78 | -7.31 | -17.78 | 12.44 | -15.40 | -6.62 | -7.23 | 29.88 | 12.48 |
| Accommodation and tourism | -12.02 | -33.37 | -38.33 | 1.73 | -40.02 | -29.54 | -35.08 | -13.25 | -3.98 |
| Services to companies | -20.90 | -21.02 | -30.03 | -25.75 | -43.38 | -43.24 | -9.24 | 7.12 | -4.26 |
| Services to persons | -1.68 | -0.58 | 14.32 | -12.95 | 1.11 | -8.42 | -6.46 | -41.74 | 9.62 |

Source: Authors' compilation, using the SABI database

From the observation of this table, in general, it can be seen that for all the indicators and both the periods studied –before and after the crisis- female-run businesses obtain lower performances than those of their masculine counterparts. There exist few small exceptions. In Table 2 positive values have been shaded in grey, that is to say those in which women have obtained better performance.

The positioning of indebtedness is very clear on this point, with the exception that large female-run companies show a better performance than their male equivalents. By contrast, the indebtedness of female microfirms (more specialised than those of men), is at a considerable negative distance compared to their male equivalents, over twenty percentage points. Nevertheless, these same female microfirms display a noteworthy productivity, far above that of male businessowners (72.32% and 37.74% before and after the crisis, respectively). These two apparently contradictory results may be explained, on the one hand, by the strong concentration of women in this segment of smaller business size and, on the other, because female business managers are taking advantages of opportunities which would permit them to reap a profit per employee (productivity, as measured in this study) considerably higher than that received by males in this same business segment.

This distance of over 20 points unfavourable to women-run companies is repeated in those belonging to the sector of services to firms, and ascends to 33% in accommodation and tourism services during the crisis phase.

It is favourable, although to a lesser degree, to women who manage large-scale businesses the figures of indebtedness and access to credit, which would indicate that from a specific size upwards the male-female differences decline or even change position, especially if the sectors in which companies operate are taken into account. On this point, the productivity of female-run companies specialised in the construction sector displays values of positioning which are much higher than male-managed firms.

With regard to economic profitability, there exist certain limited exceptions, which may be associated to the behaviour of companies in accordance with the level of previous financial leverage and following the emergence of the crisis.

3.3 Probit model

Following the methodology proposed, the Probit model employed in the 2003-2013 period permits discrimination between the results of male and female companies (Table 2).

Two approaches to these models have been obtained. On the one hand, the model has been applied to the total set of the companies in the panel and of the independent and dummy variables described in Section 2. On the other, only to panel companies localised in each of the six NUTS1 regions. That is to say, seven estimations have been performed, one general and six from a regional perspective.

Similarly, the model has a dummy variable, termed ‘crisis’, which permits the extraction of the effects of the crisis –before and during it- on the behaviour of male- and female-run companies. That is to say, whether the crisis has had different consequences upon female-owned and male-owned businesses.

The general estimation shows that the gender variable in the ownership/management of companies has statistically significant effects upon all the variables employed, both exogenous and dummy, with the exception of the dummy variable ‘agric’, which would indicate that in the companies in the agricultural-extractive sector it is not fitting to establish significant differences according to gender. However, regionally there would be such differences in three of the NUTS studied, although on a different scale and with distinct effects.

Thus, the three independent variables serve to predict gender in the ownership/management of companies. In the three cases, the ratio of indebtedness, economic profitability and financial probability, the model returns coefficients with a positive sign, which indicates that male-run companies have a greater probability of access to a higher level of indebtedness (a proxy of greater access to bank credit) and of greater profitability, both economic and financial, although in the last case significance is more reduced.

Elsewhere, the effects of the crisis are also emphasised, such that this would have had more unfavourable consequences (3.58%) for female-run businesses than is those managed by males.

In geographical terms, with regard to the region of Madrid, it is more likely that companies located in the distinct NUTS1 belong to men, according to the specific positive coefficients which appear in each case (greater in the cases of the Centre and South regions and lower in the East). Or, put another way, in Madrid –in relative terms- there is a greater concentration of women-owned companies than in the rest of the regions studied, which may be associated with its greater entrepreneurial dynamic and opportunities for business.

With regard to the dummy variables which contrast the behaviour of the size of companies (microfirms, small and medium firms compared to large companies), the results of the model indicate that female-run companies tend to be concentrated more in the lower-sized segments than do those of males. The probability of this occurring increases notably the smaller is the segment of workers per company. Thus, the probability of a microfirm belonging to a female is 55.39% greater than when the owner is male, although this probability declines when the company is small (24.42%) or medium sized (17.96%).

Sectorially, behaviour is more heterogeneous. With regard to companies in the industrial sector, those in the construction (21.95% more) and transport and communications (4.29% more) sectors are more prone to belong to males. However, the opposite occurs with firms belonging to the sector of services to persons (34.91%), accommodation and tourism (23.09%), services to companies (10.10%), commercial

distribution (3.40%) and agricultural-extractive industries (2.69%), in which there is a greater concentration of entrepreneurial women.

In this general estimation, it can be observed that in the period 2008-2013 companies belonging to males were able to better withstand the consequences derived from the crisis and subsequent recessions than those of females.

Table 2. Results from the Probit model, by NUTS regions

| Variables | Total | Madrid | East | South | Centre | Northwest | Northeast |
|----------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| debt | .0030601 (23.64)*** | .00027582 (10.09)*** | .0024176 (11.56)*** | .0029488 (8.45)*** | .0050641 (11.18)*** | .0027829 (6.42)*** | .0046902 (11.50)*** |
| eco_prof | .0027705 (8.75)*** | .0036562 (5.88)*** | .0009343 (1.72)* | .0047618 (5.99)*** | .0029929 (2.39)* | .0033751 (3.37)** | .0023556 (2.60)** |
| fin_prof | .0001345 (2.10)* | .0000641 (0.49) | .0002388 (2.14)* | .0000391 (0.25) | .0003835 (1.65)* | .0001175 (0.54) | .0000933 (0.49) |
| micro | -.5539607 (-18.44)*** | -.9210656 (-13.80)*** | -.2424878 (-5.33)*** | -.6534954 (-8.33)*** | -.4820893 . | -.4398305 (-4.45)*** | -1.035.784 (-7.39)*** |
| small | -.2442602 (-8.29)*** | -.5607416 (-8.53)*** | .0541331 (1.22) | -.3615568 (-4.71)*** | -.461525 . | -.062037 (-0.64) | -.6665011 (-4.82)*** |
| medium | -.1796259 (-5.91)*** | -.4674745 (-6.88)*** | .1544622 (3.36)** | -.4430558 (-5.64)*** | -.4495435 . | .0650113 (0.65) | -.6150671 (-4.35)*** |
| agric | -.026969 (-1.34) | .1245061 (1.78)* | .0657742 (1.57) | -.326115 (-8.50)*** | .2618219 (5.14)*** | .0080495 (0.15) | .0143585 (0.21) |
| construct | .2195973 (19.41)*** | .1810297 (6.24)*** | .2263414 (11.64)*** | .191332 (6.07)*** | .3603137 (11.03)*** | .2345281 (7.09)*** | .1443253 (4.51)*** |
| whol&reta | -.0340407 (-4.06)*** | -.0357406 (-1.55) | -.0208808 (-1.59) | -.1636933 (-7.11)*** | .2097284 (8.34)*** | .0858721 (3.02)** | -.2598454 (-10.65)*** |
| trans&comm | .0429914 (3.27)** | -.0357406 (-1.55) | .1632495 (7.15)*** | -.221957 (-6.56)*** | .1523512 (3.56)*** | .066307 (1.64) | -.0357196 (-0.94) |
| accom&tour | -.2309908 (-16.43)*** | -.111299 (-2.87)** | -.272511 (-13.68)*** | -.3303033 (-8.87)*** | .1465925 (2.70)** | -.1571717 (-2.70)** | -.517986 (-10.49)*** |
| buss_servic | -.101092 (-9.08)*** | -.0321974 (-1.32) | -.1719962 (-9.72)*** | -.2572203 -7.54 | -.2253084 (-5.75)*** | .0130329 (0.32) | .1756407 (4.41)*** |
| pers_servic | -.3491471 (-22.35)*** | -.4210677 (-11.64)*** | -.4224727 (-17.63)*** | -.2167004 (-5.03)*** | -.1744822 (-2.88)** | -.1902871 (-3.36)** | -.4254542 (-8.14)*** |
| crisis | .0358346 (5.51)*** | .0388285 (2.46)* | .0224929 (2.16)* | .0418895 (2.43)* | .0566007 (2.70)** | .0391439 (1.81)* | .0465593 (2.33)* |
| nuts2 | .0615102 (6.70)*** | | | | | | |
| nuts3 | .1255044 (11.13)*** | | | | | | |
| nuts4 | .1291001 (10.30)*** | | | | | | |
| nuts5 | .0964367 (7.48)*** | | | | | | |
| nuts6 | .0957419 (7.83)*** | | | | | | |
| _cons | 1.122.283 (35.21)*** | 1.443971 (20.52)*** | .9330334 (19.77)*** | 1.479552 (17.90)*** | 5.351481 . | .9939016 (9.66)*** | 1.623672 (11.55)*** |
| Number of obs | 25780 | 40522 | 97491 | 39119 | 27290 | 24427 | 28958 |
| Wald chi2(19) | 4397.57 | 995.39 | 1734.03 | 597.75 | . | 383.57 | 694.99 |
| Prob> chi2 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | . | 0.0000 | 0.0000 |
| Log pseudolik. | -101644.47 | -17538.016 | -39246.393 | -14373.343 | -10030.04 | -91500.018 | -10797.517 |
| Pseudo R2 | 0.0212 | 0.02276 | 0.0213 | 0.0217 | 0.0307 | 0.0195 | 0.0318 |

***Significant at above 1 per thousand; **above 1 per hundred; *above 1 per ten

Elsewhere, from the estimations performed for the six NUTS1 in which are localised the companies from the panel studied, can be extracted various interesting characteristics and differences, with regard to both the general estimation and among the distinct regions.

With regard to the exogenous variables of indebtedness and economic profitability, the same behaviour as in the general estimation is repeated in all the regions. That is to say, male-run companies have a greater probability of access to credit or other sources of indebtedness and of achieving a better result in economic profitability. However, companies located in the regions of the Centre (5.06%) and Northwest (4.69%) increase the probability of having available more debt, since their estimations display coefficients above that of the general estimation (3.06%). Madrid, by contrast, is located in the lowest part. And companies in the regions of the South, Madrid and the Northwest, compared to those of the East, present better results with regard to economic profitability.

Financial profitability, which presents a scale of significance lower in the general estimation than does economic profitability, is now only significant in the East and Centre regions. Consequently, this variable has greater consistency at the level of the territory as a whole than in each of the regions into which it is divided.

Examining the effect of business sizes with regard to gender from the perspective of each region, the same dynamic is maintained as in the general estimation: women are more highly concentrated than men in the smallest segments. However, this general vision presents regional nuances. In some regions this behaviour is sharpened. Thus, in the Centre region, principally (although the significance is unknown, since there are no large companies with which to make comparisons), but also in the Northwest (103% in the case of microfirms) and Madrid (92.10%) there is a significant increase in the probability of concentration of small-sized women-run companies. By contrast, female firms located in the East region display a lower probability of concentration in the sizes mentioned.

With regard to sectors and gender, companies in the construction sector, compared to those operating in industry, are more likely to belong to males. Furthermore, this occurs in the six regions analysed, although this is more intensely manifest in the Centre region, and less intense in the Northeast region. However, although in the general estimation this same behaviour occurs in transport and communications companies, now, regionally the same is true in the East, Centre and Northwest regions, but the contrary happens in those of the South, Madrid and the Northwest. In these three latter regions, the probability increases in favour of entrepreneurial women.

Similarly, commercial distribution companies (wholesale and retail), which at general level were more likely to be found among women, from this regional vision differences are observed. In the Centre and Northwest regions there exists a greater probability of male-run firms predominating.

In accommodation and tourism, with the exception of the Centre region, the relative presence of women dominates, principally in the Northeast, South and East.

In services to companies, favourable in the general estimation to female entrepreneurs, the opposite occurs regionally in the Northeast and Northwest regions, and in Madrid this variable presents no significance.

In personal services the tendency of the general estimation is confirmed, which awarded greater probability to female-run companies, and which now is repeated in all regions. The regions of the Northeast, East and Madrid are above the average probability.

Finally, in all the regions the impact of the crisis has had worse consequences for companies in the ownership of women.

5. Conclusions and discussion framework

Within the context of the influence which gender has upon business activity, the present study analyses the behaviour of female entrepreneurs in Spain, relating it to that of male entrepreneurs. Concretely, the study calculates and evaluates the differences of gender in the level of indebtedness of companies (a proxy of the access to credit) and in their economic and financial results, taking 2003-2013 as the period of evaluation, so that the two recent phases of expansion and crisis of the Spanish economy are included.

The study is based on a panel of 23,504 companies, basically SMEs (only 334 are large companies), of which 3,262 are the property of women and 20,242 of men. The panel is organised in accordance with three criteria which facilitate the analysis of gender differences: business size (measured by employment), sector (eight large branches of activity) and the localisation of companies (in accordance with NUTS-1 regions). This broad set of companies offers complete information on the mercantile origin of two indicators, indebtedness and economic profitability, for the eleven years of the study. However, other indicators are also considered, such as financial profitability, EBITDA over assets, productivity and credit over assets.

This panel, despite being robust and extensive, is not properly representative of the Spanish business structure, although it offers a good framework of reference for that structure and as well of gender in business activity. The greatest bias is found in the low participation of the smallest companies (microfirms) in the panel, as it contains 16.2%, of the total, while in the general structure of the economy it is 85.9%. Consequently, this signifies a greater participation of small and medium-sized businesses. It is fitting to believe that this circumstance is due to the lower capacity of informational transparency (mercantile) of the smallest companies. In the panel, however, 24.1% are female-owned micro companies and 14.9% are male-owned micro companies, indicating that the greater preponderance of these very small firms are in the hands of female entrepreneurs.

The study of companies according to gender has been performed via an economic-financial analysis (and positioning of women-owned companies) and another econometric one. The first serves as a contemplation and reference framework for the second, although in the first two more variables have been included (productivity and bank credit over assets); these have been excluded from the second analysis due to their

strong correlation with the other independent variables (indebtedness, economic profitability and financial profitability).

In general accordance with the specialist literature, companies managed by women display lower performance in the economic-financial indicators employed, a tendency which was maintained or worsened with the arrival and deepening of the crisis. This evidence, found in the panel of Spanish companies, would correspond with the dominant typologies of the sectors and size of the companies in which women operate (Rosa et al, 1996; Ehlers and Main, 1998; Watson, 2002; Coleman and Robb, 2009). This, in turn, is associated with the sociocultural role of gender: in general, a) women entrepreneurs spend less hours per week to the company, which means less capacity to transform financial capital into income (Díaz and Jiménez, 2010), b) time devoted to household chores and childcare is greater, and c) the choice of staff with greater female presence (Crespo-Espert et al, 2012).

This general conclusion takes concrete shape with the specific evaluation of each of the indicators studied.

Thus, the lower degree of indebtedness in the case of female entrepreneurs is notable, both before and after the emergence of the crisis. And it is in line with the selection of smaller business sizes or with sectors which, in general, require lower capitalisation (Klapper and Parker, 2010; Carter et al. 2004), with a higher probability of aversion to risk which hinders the access to external finance (Verheul et al., 2008) or the requirement of greater guarantees and interest (Muravyev et al., 2009). There exist, however, some studies which have not obtained evidence regarding this widespread obstacle to the access to the financing of female-run businesses (Van Hulten, 2012, Pablo-Martí et al. 2014).

It is also convenient to underline that in large companies which belong to women, above all, but also in medium-sized firms, the level of indebtedness may be greater than in male-controlled companies. This characteristic would indicate that, despite the strong concentration of females in the segment of microfirms, when the size increases, the probability that the access to external debt is a greater obstacle than in the case of men.

As occurs with indebtedness, the favourable situation to males, both before and after the crisis, is reproduced with economic and financial profitability. Regionally, economic profitability is significant in all the NUTS1, while its financial counterpart is only so in three of them.

Regionally, significant differences are not observed, although in the companies of the Centre and North, the probability of acceding to greater debt is greater. Similarly, in the region of Madrid there exists the greatest relative concentration of female-run microfirms.

Finally, from a sectorial vision, female-run companies are concentrated above all in commercial distribution, accommodation and tourism, services to companies and personal services, although in some regions there exist exceptions in favour of males. These sectors, in general, are prone to lower capitalization and lesser size and,

consequently, lower risk and a lower proportion of external resources. By contrast, male-run companies are concentrated in the industrial, construction and transport and communications sectors. In this last sector, however, on introducing the regional perspective it is observable that three of the six NUTS1 regions follow this behaviour (East, Centre and Northwest), while the other three display specialisation in female-run companies (South, Madrid and Northeast).

In summary, in the period 2003-2013 women-led companies have in general displayed worse performance than that of male-controlled businesses. This tendency has been repeated in each of the three economic-financial indicators studied. Similarly, the crisis has generated more unfavourable consequences for these female-run companies. Thus, the crisis has not modified in Spain the behaviour and general tendencies regarding access to external funds and the results of business activity directed by women.

Such evidence and conclusions would appear to indicate that in the phase of economic recovery certain policies leading to the promotion of women in Spanish business could be addressed. This could further strengthen the trend, already observed before the crisis, of increasing the participation of female entrepreneurs in the Spanish productive structure. Furthermore, new policies, well-targeted and evaluated periodically, should strengthen the areas in which women's businesses are weakest. In particular, these could include specific incentives aimed at: i) increasing the size of women-owned businesses (including the assumption of greater risks); ii) increasing the participation of women-owned businesses in sectors where their presence is not dominant (including greater capitalization of companies). Such incentives would facilitate access to external funding and would improve the economic performance of their companies.

References

- Brush, C. G. and Gatewood, E.J. (2008), Women growing business: Clearing the hurdles, *Business Horizons*, 51, 175-179.
- Brush, C.G. and Hisrich, R.D. (1991), Antecedent Influences on Women-owned Businesses, *Journal of Managerial Psychology*, 6 (2), 9-16.
- Carter, S. and Shaw, E. (2006), "Women's Business Ownership: Recent Research and Policy Developments", Report to the Small Business Service, United Kingdom, UK, November.
- Carter, S., Shaw, E. and Wilson, F. (2004): Securing a business loan: How women entrepreneurs view banks and how banks view them, Babson College, <http://www.babson.edu/entrep/fer/BABSON2003/XXVI/XXVI-S2/XXVI-S2.html>.
- Coleman, S. and Robb, A. (2009): A comparison of new firm financing by gender: evidence from the Kauffman Firm Survey data, *Small Business Economics*, 33, 397-411.

- Coleman, S. and Robb, A. (2009): A comparison of new firm financing by gender: evidence from the Kauffman Firm Survey data, *Small Business Economics*, 33, 397-411.
- Crespo-Espert, J.L., García-Tabuenca, A. and Pablo-Martí, F. (2012), Women, entrepreneurial activity and territory: differences or myths?, in Karlsson, Ch., Johansson, B. and Stough, R.R. (ed.), *Entrepreneurship, Social Capital and Governance*, Edward Elgar Publishing, Inc., Cheltenham, UK and Northampton, MA, USA, 2012.
- Diana Project (2015), <http://www.dianaproject.org/> (extraído 19 mayo 2015).
- Díaz García, M.C. and Jiménez Moreno, J.J. (2010): Recursos y resultados de las pequeñas empresas: nuevas perspectivas del efecto género, *Cuadernos de Economía y Dirección de la Empresa*, 42, 151-176.
- DIRCE-INE (2015), http://www.ine.es/inebmenu/mnu_empresas.htm (extraído 25 mayo 2015)
- Ehlers, T.B. and Main, K. (1998): Women and false promise of micro-enterprise, *Gender and Society*, 12 (4), 424-440.
- European Commission (2008), *Evaluation on Policy: Promotion of Women Innovators and Entrepreneurship*, DG Enterprise and Industry,
- Hisrich, R.D. and Brush, C. G. (1983), The woman entrepreneur. Implications of family educational and occupational experience, en *Frontiers in entrepreneurship research*, 255-270. Wellesley, MA: Babson College.
- Klapper, L. F. and Parker, S.C. (2010): Gender and the Business Environment for New Firms Creation, *The World Bank Research Observer*, DOI: 10.1093/wbro/lkp032.
- Klapper, L. F. and Parker, S.C. (2010): Gender and the Business Environment for New Firms Creation, *The World Bank Research Observer*, DOI: 10.1093/wbro/lkp032.
- Loscocco, K. A., Robinson, J, Hall, R.H. and Allen, J.K. (1991), Gender and Small Business Success: An inquiry into Women`s Relative Disadvantage, *Social Forces*, 70, 1, 65-83.
- Muravyev, A., Talavera, O. and Schäfer, D. (2009): Entrepreneur´s gender anf financial constraints: Evidence from international data, *Journal of Comparative Economics*, 37, 270-286.
- OECD (2004), *Women´s Entrepreneurship: Issues and Policies*, 2nd. Conference of Ministers Responsibles for Small and Medium-Sized Enterprises (SMEs), Istanbul, Turkey, <http://www.oecd.org/dataoecd/6/13/31919215.pdf>
- Pablo-Martí, F., García-Tabuenca, A. and Crespo-Espert, J.L. (2014), Do Gender-Related Differences Exist in Spanish Entrepreneurial Activities?, *International Journal of Gender and Entrepreneurship*, 6, 2, 200-214, 2014.
- Rosa, P., Carter, S. and Hamilton, D. (1996): Gender as a determinant of small business performance: insights from a British study, *Small Business Economics*, 8, 463-478.
- Schwartz, E. (1976), Entrepreneurship: A new female frontier, *Journal of Contemporary Business*, 5(1), 47-76.

- Van Hulten, A. (2012), Women's access to SME Finance in Australia, *International Journal of Gender and Entrepreneurship*, 4, 3, 266-288.
- Verheul, I. (2005), Is there a female approach? Understanding gender differences in entrepreneurship, Doctoral Thesis, Erasmus Research Institute of Management (ERIM), <http://repub.eur.nl/resource/publication:2005/index.html>
- Verheul, I., Carree, M. and Thurik, R. (2008), Allocation and productivity of time in new ventures of female and male entrepreneurs, Max Planck Institute of Economics Group entrepreneurship, Growth and Public Policy, Jena, Germany.
- Verheul, I., Carree, M. and Thurik, R. (2008): Allocation and productivity of time in new ventures of female and male entrepreneurs, *Max Planck Institute of Economics Group entrepreneurship, Growth and Public Policy*, Jena, Germany.
- Watson, J. (2002): Comparing the Performance of Male- and Female-controlled Businesses: Relating Outputs to Inputs, *Entrepreneurship Theory and Practice* 26, 3, 91–100.