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# Does Gender Matter in Strategies Adopted to Face the Economic Crisis? A Comparison Between Men and Women Entrepreneurs

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## Abstract

The purpose of this paper is to understand how Italian micro-entrepreneurs responded to the economic crisis and strategies they adopted to deal with it. A comparison between male and female entrepreneurs is presented, in order to understand if they adopted similar or different strategies. The paper also aims to understand if variables, other than gender, influenced strategies adopted to face the economic crisis. Drawing from a telephone questionnaire survey involving a sample of 300 (150 male and 150 female) owners of Italian micro-enterprises, located in Marche Region, findings suggest that entrepreneurs mostly dealt with the crisis through a defensive approach (restructuring and resizing strategies). Compared to men, female entrepreneurs had a lower propensity towards offensive strategies (innovation, development and growth). Differences in the approach towards the crisis were also identified with respect to company's age, industry and impact of the crisis. These findings contribute to the debate on gender-based differences in behaviors, attitudes and preferences. Moreover, they can help to identify economic policy measures useful to help men and women entrepreneurs to address the crisis. Policy-makers who want to support female entrepreneurship should consider these aspects, in order to identify tools and policies that can help female firms to resist the crisis more effectively in the short-term and to seize new market opportunities in the recovery phase. The sample is restricted to sole proprietors and to a limited geographical context. So further analysis should involve companies of different sizes and located in different geographical contexts, both in Italy and abroad.

**Jel classification:** L10; L26

**Keywords:** economic crisis, micro-entrepreneurs, strategies, gender, women entrepreneurs

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## 1. Introduction

The recent economic and financial crisis has had a strong impact on the Italian economy, and has put Italian companies into great difficulty. The number of bankruptcies and non-bankruptcy insolvency procedures has continued growing relentlessly [1]. However, in Italy, statistical data show that female enterprises have fared better and have resisted the economic crisis more effectively than male ones. For instance, in the period 2011–2012 the stock of Italian enterprises decreased by 0.49% (29,911 enterprises), while the number of female businesses showed only a very slight reduction (–0.04%, 593 enterprises). In the period December 2012–December 2013, moreover, the number of female businesses increased by 0.75% (+10,713 units), a value higher than that reported in all Italian companies, equal to 0.56%. More recently, using data available as on March 31, 2014, female businesses increased by 6605 units over the past 12 months, thus achieving a growth rate of 0.51%, more than twice that in the total enterprises (0.2%) [2].

These data clearly show that, at the aggregate level, Italian female businesses have shown a greater resistance and have been able to deal with the crisis better than male companies. In this context, it is important to understand how companies have dealt with the crisis and what strategies male and female businesses have taken to deal with the economic downturn.

In studies about business strategy, there is a range of strategies that companies can adopt when they face a crisis: innovation and development strategies; restructuring strategies; downsizing strategies and reorganization strategies [3–9]. These studies, however, do not consider the gender of the entrepreneur and do not take into account whether male and female businesses can opt for different solutions when they face with an economic downturn. In contrast, in other studies, especially in entrepreneurship studies, the existence of significant differences between men and women entrepreneurs is proven, for example, in terms of risk taking, propensity towards investments, innovation, development and growth [10–13].

These factors can significantly affect the choice of business strategies. For this reason, it is important to compare the behavior of male and female entrepreneurs, in order to understand if there are differences in the way they have dealt with the crisis. As stated, this is a so far neglected question in business strategy studies, as they dealt with strategies to face crisis situations and with factors affecting this choice, but they neglected the impact of gender. On the other hand, in entrepreneurship studies, some differences between men and women entrepreneurs have been identified, but their role in influencing how to deal with crisis has not been addressed. For this reason we propose the following research questions:

1. What strategies did men and women entrepreneurs adopted to face the economic crisis?
2. Did men and women entrepreneurs adopted similar or different strategies?

Economic downturns do not affect in the same manner and with the same intensity in all businesses. In fact there are different variables that can affect the impact of an economic downturn: size [14–18], industry [19–21], capital structure [22], business' age [5]. That is why, when analyzing strategies adopted to face the recent economic crisis, it is also important to answer the following research question:

3. Did variables, other than gender (industry, age of the business, performance and entrepreneurs' age), influenced strategies adopted to face the economic crisis?

In order to answer these questions, a survey research was carried out and a questionnaire was submitted to a sample of 300 Italian micro-enterprises, located in Marche Region.

Results from this research contribute to the debate on gender's influence in explaining behaviors of men and women entrepreneurs. This analysis in fact shows that, under the same external conditions, men adopted offensive strategies more often than women. Differences in the approach to face the crisis were also identified with respect to company's age, industry and impact of the crisis.

The paper is structured into four parts. In the first part, a literature review on strategic responses to economic crises and on factors influencing strategic choice is presented. Next, methodology employed in the empirical research is described. Finally, key results from the research are discussed and the main conclusions are drawn.

## 2. Literature review

### 2.1. Defensive or offensive strategies to face economic crises?

It is generally accepted that companies can adopt two types of strategies when they face an economic downturn: the first is the adoption of measures aimed at maintaining efficiency through cost-cutting, selling of non-strategic assets and reducing personnel costs; the second is realized through new investments, organizational/technological innovations, introduction of new products and processes, research for new markets and new customers. The first is a defensive choice, intended to guarantee business survival in the short-term, whereas the second is an offensive choice, aimed at creating opportunities for long-term value creation. According to Miles and Snow [23], the first corresponds to the *defenders's* approach, while the second characterizes the behavior of firms labeled as *prospectors*.

From another perspective, firms may face an economic crisis by adopting externally or internally directed strategies. The former requires actions directed towards the market and aimed to change marketing strategies, pricing strategies, international orientation, etc. The latter involve actions directed towards the firm in order to change structures, processes, systems or resources used [9, 24].

In this wide range of possibilities, and combining both perspectives, four main strategies may be identified to explain how firms may respond to an economic crisis: restructuring strategies; resizing strategies; reorganization strategies and innovation strategies [5, 9, 25].

Restructuring strategies are internally directed actions that involve cutting costs in order to improve efficiency. Such strategies relate to traditional product/market combinations and do not involve significant dimensional variations. Firms try to improve efficiency by improving productivity and reducing expenses on a wide range of activities. Resizing strategies are external-directed actions oriented to refocusing the core business and disinvesting non-core

assets. Disinvestment of products/product lines, withdrawing from markets, selling parts of the business, closure of plants or production sites are examples of resizing actions [5, 9].

Both restructuring and resizing strategies are defensive in nature [26] and they are the most common approaches adopted by firms to deal with economic crisis [5, 27–29], especially in the short-term [6]. Even in Italy, a recent survey involving a sample of small firms confirmed that defensive strategies were most frequently used to deal with the crisis [30, 31]. Some authors [28] argue that firms that adopt this approach tend to cut above all costs and assets that can be more easily repurchased, such as low-skilled workers, not strategic raw materials, etc.

About the effectiveness of such strategies in times of economic crisis opposing assessments can be made [5]. Adopting a positive perspective, an economic crisis can be an incentive to improve and rationalize the company, through a critical review of its products portfolio and focusing on its core business. A crisis also leads firms to improve efficiency and reduce operating costs by optimizing asset utilization and divesting marginal and less profitable activities. However, there are negative aspects. Cutting costs and activities, in fact, is often a knee-jerk reaction to adverse market conditions, but it did not involve any strategic repositioning of the company. As a consequence, cost- and asset-cutting can weaken business's competitiveness and reduce its ability to successfully face the later stages of economic recovery.

Defensive strategies are very common for firms in times of crisis [17, 28, 32–34]. However, other studies suggest alternative strategies to cope with the crisis. They require countercyclical investments and technological/organizational innovations, aimed at strengthening the company and allow it to better tackle the economic crisis and become more competitive and better prepared for the post-recession phase. These strategic responses seem inspired by Penrose's idea that "depression is sometimes looked on as a good time to expand: costs are low, plant can be constructed and equipment bought cheaply" [35].

Reorganization strategies and innovation and development strategies belong to this second group. Reorganization strategies are internally directed actions focused on improving organizational aspects, for instance by redefining responsibilities, enhancing information system controls, investing in human resources and so on. Such strategies aim to requalify the firm and improve its organizational structure. Some authors assert that investments in human resources [25, 36] and employee benefits are useful to maintain commitment during an economic crisis [37].

Innovation strategies are externally directed actions concerned with businesses' competitive position. They adopt an offensive approach [26] and examples include investment into new markets, new product development, business diversification and increased marketing investments [6, 9, 25]. These strategies require firms' ability to perceive economic crisis as "opportunities to invest, innovate and expand into new market in order to achieve or extend a competitive advantage during the recession and beyond" [6]. However they are risky and not easy to implement, not only because they require firm's ability to look beyond and not to dwell on the difficulties of the moment, but also because they often require large amount of financial resources, managerial competences and technical expertise.

Indeed during an economic crisis, business owners and managers have to face a dilemma: to favor a short-term perspective and thus protect the current financial performance, or to



look at the long-term and make new investments. The latter cause an immediate absorption of resources, but they can enhance companies' competitive position and allow long-term advantages. The two alternatives cause opposing risks: emphasis on short-term performance is likely to weaken companies' long-term competitiveness and their performances can deteriorate in the post-recession; on the contrary, focusing on long-term goals, companies should expend resources and thus cause a further deterioration of the immediate performance, further threatening their survival. Some studies show that too much emphasis on downsizing and cost cutting strategies can lead to negative effects in the long-term [17], while anti-cyclical actions can facilitate achieving high performance in the phase of economic recovery [38, 39]. Pearce and Michael [15], through the analysis of a sample of start-up manufacturing firms, showed that firms that had made marketing investments achieved higher earnings than companies that had cut costs during the recession.

A solution to this dilemma is the so-called ambidextrous strategies [6] that combine both efficiency improvements and strategic investments [9, 27, 40].

## **2.2. Gender differences in strategies adopted to face the economic crisis**

According to Shama [20], strategic response to an economic recession depends on how entrepreneurs/managers perceive its impact on their business. As a consequence, they will "take different tactical and/or strategic measures to adjust or even to exploit changes in the economic environment" ([20], p. 62). This means that companies' response to an economic downturn may be conditioned by entrepreneurs' set of priorities, motivations, preferences, skills, knowledge and abilities. Actually companies' performances, rather than being the direct result of external factors, are affected by decisions and choices of the control group. These choices, in turn, also during economic downturn, are significantly affected by leader's cultural, psychological and cognitive characteristics, as well as by his/her skills and experiences. This means that in every business, the decision-maker makes his/her own personal assessment of the seriousness of the crisis and its possible consequences in the short- and long-term. Based on these elements, he/she chooses what he/she considers the most effective way to respond to the crisis [25, 41]. It follows that, facing the same economic scenario, different firms may adopt different behaviors, and this is particularly true during economic downturns. A crisis, in fact, is a complex phase and it is difficult to interpret, so that it is often impossible to foresee its evolution. In the absence of certainty, perceptions of managers and entrepreneurs are key to choose company's reaction to the crisis [24, 41].

The influence of decision-maker's perceptions – in small businesses identified with the entrepreneur – in determining business' reactions to an economic crisis is widely accepted [6, 9, 20, 25, 42]. Analysis focused on factors affecting the choice of strategies to tackle the crisis, however, have neglected entrepreneur's gender. This is an important gap. In fact, there are many studies that show the existence of significant differences between male and female entrepreneurs – and more generally between men and women – in terms of risk taking, propensity towards investments, innovation, development and growth. These factors can significantly affect the choice of business strategies.

Several researches in sociology and psychology have shown that women are less risk-oriented than men [11, 12]. According to Arch [43], this difference is due to the fact that men tend to interpret risky situations as challenges that stimulate their desire for involvement and participation, while women tend to interpret them as threats and are so induced to avoid them. Lower women's propensity for risk is also confirmed by other research [44–47], that compare the behavior of men and women involved in financial decisions. According to other authors, women have lower self-confidence than men [48, 49], especially in some typically masculine areas, just as finance. Barber and Odean [50] verify that men have a greater self-confidence and therefore take riskier financial choices than women.

Research on this topic, however, show that women's preferences with regard to financial investments are not the result of their psychological characteristics, but they are affected by their social status. Women's preference for investments with a lower financial risk, in fact, could be explained by their lower knowledge in financial matters (financial literacy) and their lower average incomes [51, 52]. Other research related to men and women entrepreneurs confirms the existence of gender-based differences in risk propensity, even if there are other studies that contradict these findings [53, 54]. According to Cliff [10], women are more concerned than male entrepreneurs about risks associated with rapid growth and this is why they deliberately prefer a slow and steady rate of expansion. According to Sexton and Bowman-Upton [55], women entrepreneurs are less willing than men to get involved in situations of high uncertainty, even when it comes to the opportunity to achieve financial and economic benefits. Moreover, they argue that women are not equipped with time, energy and resources necessary to manage a growth-oriented firm [56]. Other reasons that explain female businesses' lower propensity to growth are [57]: women's difficulties to balance work and family responsibilities; difficulties in accessing to financial resources [58, 59]; women mainly owned retail and service firms, that are less oriented to growth; women entrepreneurs are less concerned with achieving high financial performance while they are more interested in personal satisfaction and self-fulfillment [60]; in female firms growth should be viewed in a qualitative perspective [60–67].

According to Pelger [13], women's priorities play a central role in explaining female companies' lower propensity to invest. The latter is not the result of financial problems or other limitations connected to the firm. It is rather the consequence of women's goals when they engage themselves in entrepreneurial activity. As Pelger [13] pointed out, women entrepreneurs are less inclined to invest and they are less likely than men to name sales increases, innovation, R&D and implementation of new products as their investment goals. For this reason, women entrepreneurs may have had a lower propensity towards innovation/development strategies, which would have required new investments and the willingness to accept risks associated with them.

Cliff [10] argues that women's goal size on average is lower than that pursued by men. For women, the ideal size is the one that allows to maintain company's control and to devote a proper amount of time and energy to business, in order to easily balance work and family. According to this author [10], "this more cautious approach toward business expansion may result in ventures that are able to out-survive those headed by entrepreneurs pursuing more risky, high-growth strategies".

In conclusion, existing investigations about women entrepreneurs' characteristics have revealed the existence of significant differences with men entrepreneurs, especially in terms of

propensity to risk, investment, growth and innovation. These differences may have resulted in a different approach to deal with the recent economic crisis. As stated in the previous pages, in fact, numerous and very different from each other are strategies that a company can adopt to deal with an economic downturn. This choice is very influenced by entrepreneurs' perception and their individual characteristics. In turn, the latter are very different with respect to gender.

For this reason, we hypothesize as follows:

*H1. Women entrepreneurs adopted offensive strategies less frequently than men to face the crisis.*

### **2.3. Factors influencing strategies adopted to face the crisis**

An economic recession on the national level may affect firms differently, depending on their regional location, industry or other factors. Actually economic crises do not affect in the same way and with the same intensity in all businesses. In fact many variables can affect the impact of a crisis on firm's stability, as well as the ways in which each firm decide to deal with it. Some authors [14–18] stress the importance of size and maintain that small firms are more vulnerable in situations of economic recession [5, 68]. The reason is their lack of resources and skills and, as a consequence, the more narrow range of answers they can develop to face the crisis [14, 15, 69]. Actually, data relating to recent Italian situation show that, other things being equal, small businesses have suffered with the effects of the crisis more than large firms [70]. Moreover, small businesses usually face the crisis with a more reactive than proactive approach, as they often lack necessary resources and skills to direct events in their favor. Small firms, however, possess more flexible organization and processes and are better able to quickly modify them to adapt to environmental changes [16, 18].

Apart from business size, the impact of an economic crisis may depend on business industry [19–21]. In Marche region, data from Bank of Italy confirms the importance of industry in determining the crisis' impact. In this region, in fact, it was stronger for companies operating in certain sectors, such as construction and mechanics, while it was less strong for companies in the service sector.

Variables affecting crisis' impact and strategies adopted to face it also include business' age and experience. Latham [5], for instance, maintain that start-ups are more vulnerable, as they "typically lack the resource pools that may afford a "wait-it-out" approach during environmental duress" ([5], p. 181). His research about software industry suggests that start-up organizations were much more inclined to pursue revenue-generating strategies to face economic crisis, while larger and more mature firms preferred cost reduction strategies.

Based on results of such analysis, we put forth the following hypotheses:

*H2. Strategies adopted to face the economic crisis vary by business's age.*

*H3. Strategies adopted to face the economic crisis vary by business's industry.*

*H4. Strategies adopted to face the economic crisis vary by entrepreneur's age.*

*H5. Strategies adopted to face the economic crisis vary by its impact on businesses.*

In order to test these hypotheses, this paper results from an empirical analysis are presented.



### 3. Method, sample and data collection

A survey research was carried out among a sample of Italian sole-proprietors, owners of micro-enterprises. Firms included in the sample are located in Marche region, in central Italy. Several reasons justify the choice of this region for the empirical research. Firstly, Marche has a particularly high concentration of micro and small enterprises; the average size of regional businesses is 3.6 employees, against the national average of 3.9 employees [31]. Secondly, the impact of the economic crisis has been particularly harsh in this region. In 2009, the regional GDP declined by 5.4% [31], the joint-stock companies' mortality rate has been the highest in Italy (7.5%) [1] and the number of craft enterprises decreased by 5.1% between 2008 and 2012. Moreover the regional feminization rate (24.3%) is slightly higher than at the national level (23.6%). Even in this region, female businesses have resisted the crisis more effectively than male ones [2]. In the period June 2012–June 2013, in fact, in the Marche region, the balance of firms was negative (less than 608 units), while the balance of female businesses was positive, albeit slightly (+8 units equal to 0.02%) [2]. For all these reasons, Marche region is ideally suited to such a study.

The decision to involve only sole-proprietors in this survey has several reasons: (1) it is easier to establish a relationship between entrepreneur's gender and strategies adopted to face the crisis (in companies with male and female members is not easy to determine if strategic decisions are actually taken, or influenced, by a man or a woman); (2) despite the presence of many female companies and partnerships, in Italy sole proprietorships represent a very high percentage of the total number of female businesses (61% in 2010); (3) it was easier to correctly identify female businesses, as information about the gender of shareholders, partners and directors are not always available.

A non-proportional stratified sample, with the same number of men and women, was selected using the list of members of one of the main regional business associations. First of all, businesses founded after 2008 were excluded. The purpose of the survey, in fact, was to understand how the onset of the crisis has changed male and female firms' strategies. Starting from a list of 1627 sole-proprietors (429 women and 1198 men) a sample of 300 sole-proprietors (150 men and 150 women) was randomly extracted.

Entrepreneurs selected this way, took part in a telephone questionnaire between October and November 2013 and were asked questions regarding actions implemented to face the crisis. Questions refer to the previous 5 years. Sample entrepreneurs were given a list of 16 strategic actions devised from prevailing literature on this subject (**Table 1**) and were asked the following question: "In the last 5 years did you carry out any of the listed actions in order to deal with the crisis?" They were asked to score each action according to a 5-point Likert scale, in which 1 = Definitely not; 5 = Definitely. The survey enabled us to obtain 218 fully completed questionnaires. Women compiled 110 and men 108 questionnaires. The response rate was particularly high, standing at 73% and substantially similar for both genders (men: 72% and women: 73.3%).

Information gathered through the questionnaire has been used to:

	Mean	Standard deviation	Variance
Costs and waste reduction	4.32	0.973	0.947
Labor costs reduction	3.89	1.128	1.273
Deferment of investments	3.20	1.400	1.959
Production volumes reduction	2.26	1.305	1.703
Prices reduction	2.74	1.456	2.120
Improvement of production processes and products	1.46	0.854	0.729
Organisational or technological innovation	1.30	0.658	0.433
New products/services	1.49	0.932	0.869
Search for new clients	1.65	1.020	1.041
Communication and advertising	1.63	0.933	0.871
Interfirm collaboration	1.18	0.568	0.323
More qualified personnel	1.09	0.334	0.111
Staff training	1.21	0.606	0.367
Production volumes expansion	1.16	0.597	0.357
Prices increase	1.11	0.415	0.172
New collaborators or partners	1.10	0.358	0.128

**Table 1.** Strategic actions adopted to face the crisis (descriptive variables).

1. identify strategies adopted to face the economic crisis;
2. understand if male and female entrepreneurs faced the recession through similar or different strategies and
3. understand if other variables, other than gender, influenced strategies adopted to face the economic crisis.

Based on results from literature analysis, factors considered to compare strategies adopted to face the crisis, apart from gender, have been: (1) business' age; (2) business industry; (3) entrepreneurs' age and (4) crisis' impact. We did not consider business size as our sample only includes micro-enterprises.

## 4. Main results

### 4.1. Men and women micro entrepreneurs in front of the crisis. Strategic responses

The most frequently adopted strategic actions were identified on the basis of scores given to each action listed in the questionnaire (**Table 1**). Data show that entrepreneurs dealt with the

crisis through a primarily defensive approach. Most frequently adopted measures were in fact related to restructuring and resizing strategies. The most frequent actions were: reduction of waste and costs, labor costs reduction, deferment of investments and production volumes reduction. On the other hand, actions related to innovation, development or reorganization were less widely adopted. Only few entrepreneurs expanded their activity and production volumes, invested in training projects, introduced innovations, invested in communication and advertising, improved production processes and/or products/services, introduced new products/services and sought for new clients.

It is interesting to note that only few entrepreneurs have taken action based on collaboration with other companies to address the crisis. This result is in contrast with the findings from similar research recently carried out in Spain [25]. According to this research collaboration between firms emerged as one of the more effective ways to address and overcome the crisis.

#### 4.2. Factor analysis and strategic profiles

In the following step of the analysis, 16 actions listed in the questionnaire were submitted to factor analysis. In this way, we tried to more effectively outline entrepreneurs' behavior during the crisis, by identifying a more limited number of factors describing typical strategic profiles [71]. The aim of the factor analysis was not to confirm the validity of the pre-existing model, but to identify the variety of strategic behaviors during the crisis. Consequently, a varimax orthogonal rotation analysis was carried out considering a non-correlation among factors. Factors were extracted considering a method of parallel analysis [72]. After having extracted four factors, the factor structure shown in **Table 2** was obtained. In this phase, one strategic action was eliminated (lowering of prices), as it had a factor coefficient lower than 0.5 [73].

Extracted factors correspond to four different strategic profiles. Each profile corresponds to actions, which have resulted as the most significant to identify the strategic behavior of each entrepreneur.

Each factor has been labeled, in order to point out the typical behavior corresponding to each strategic profile. The strategic profiles corresponding to each factor are as follows.

*Factor 1: Orientation to human resources qualification.* Entrepreneurs corresponding to this profile interpreted the crisis as an opportunity to enrich their intangible assets and invested in particular in human resources. They employed more qualified personnel, looked for new collaborators and partners and participated in training courses in order to improve business's qualification and skills. This strategic behavior may be based on the desire to differentiate themselves from competitors. Business requalification was followed by an increase in products/services' costs, as clients should be willing to pay a premium price for products and services.

*Factor 2: Orientation to development and growth.* Entrepreneurs with this profile tried to counter the crisis with measures aimed at turning around the negative trend of demand and sales. Such an objective materialized in actions and investments aimed at reorganizing the business and renewing its technology, in order to increase volume of production and sales and improve

Strategic actions	Strategic profiles			
	F1	F2	F3	F4
More qualified personnel	0.816			
New collaborators or partners	0.807			
Price increase	0.791			
Training of staff	0.560			
Improvement of production processes and products		0.807		
Organisational or technological innovation		0.779		
Expansion of the activity		0.685		
Interfirms collaboration		0.519		
Deferment of investments			0.807	
Reduction of waste and costs			0.788	
Reduction of labour costs			0.783	
Reduction of production volumes			0.686	
Communication and advertising				0.849
Search for new clients				0.754
New products/services				0.634
Percent Explained Variance	17.457	16.404	16.366	13.210
Test Bartlett < 0.5 e KMO > 0.7.				
Overall, the four factors explain 63.437% of the total percentage variance.				

**Table 2.** Factor analysis results. Strategic profiles matrix.

processes and products. A minority of entrepreneurs with this profile also started collaboration with other entrepreneurs to share costs and investments and realize joint projects.

*Factor 3: Orientation to downsizing.* This profile corresponds to entrepreneurs who reacted to the crisis through a defensive approach. The initiatives adopted, in fact, include cost cutting, waste elimination, labor costs reduction, deferment and/or cancelation of investments and reduction of production volumes. Ultimately these entrepreneurs placed the priority on the survival of their businesses. Consistent with this purpose, they gave up making new investments, redefined their core business activities and tried to increase the efficiency of remaining activities.

*Factor 4: Orientation to market.* Entrepreneurs with this profile tried countering the crisis with actions aimed at resisting the negative trend of demand. They redefined their supply and sought new opportunities for expanding demand. Measures were mainly geared to introducing new products and services, exploring new markets and looking for new clients. Such actions were accompanied by initiatives of communication and advertising, to increase business' reputation and improving its image.

4.3. Gender and other variables influencing strategic response to economic crisis

In order to answer our research questions, firms included in the sample have been divided into subgroups, identified according variables mentioned in research hypothesis. These variables are described in **Table 3**.

After having applied Levene’s test to verify the hypothesis of variance equality among groups, a t-test robust has been applied to evaluate the existence of significant differences among factors’ average scores, corresponding to strategic profiles described in **Table 2**. Results from t-test are described in **Table 4**.

Crisis’ impact was measured using entrepreneurs response to the questionnaire. They were asked to evaluate crisis’ impact on their business, using a 5-points Likert scale in which 1 = Extremely important and 5 = No impact.

The comparison between men and women entrepreneurs shows that a significant difference exists with respect to strategic profiles corresponding to Factor 1 – *Orientation to human resources qualification* – and Factor 2 – *Orientation to development and growth*. In both cases men entrepreneurs have obtained a higher factor score than women entrepreneurs. On the contrary no significant differences emerge with regard to strategic profiles corresponding to Factors 3 and 4. This suggests that, although the prevalence of a defensive approach is what men and women entrepreneurs had in common (see also **Table 1**), men adopted an offensive approach more frequently than women. So this result confirms hypothesis in H1, as *women entrepreneurs* dealt with the crisis with an offensive approach less frequently than men and preferred downsizing their activities and increasing efficiency. To this end they reduced costs, cut unprofitable and marginal activities and focused on core business. Although such an attitude is rather widespread even among men entrepreneurs, the latter dealt with the crisis in a more diversified way. As a matter of fact, the percentage of men adopting offensive strategies, to requalify human resources and obtain business growth and development, has been markedly higher.

The comparison based on other variables described in **Table 4** has shown some differences in how companies dealt with the crisis.

Variables	Description
Gender	<ul style="list-style-type: none"><li>• Woman</li><li>• Man</li></ul>
Business’ age	<ul style="list-style-type: none"><li>• Young</li><li>• Mature</li></ul>
Industry	<ul style="list-style-type: none"><li>• Service and trade</li><li>• Manufacturing and construction</li></ul>
Entrepreneur’s age	<ul style="list-style-type: none"><li>• Young: less than 35</li><li>• Senior: more than 34</li></ul>
Crisis impact	<ul style="list-style-type: none"><li>• Low: values lower than the sample median</li><li>• High: values higher than the sample median</li></ul>

Table 3. Variables.



Variables	Description	N	F1	t-Test	F2	t-Test	F3	t-Test	F4	t-Test
Gender	Women	110	-0.179	***	-0.410	***	0.057	ns	-0.069	ns
	Men	108	0.182		0.418		-0.058		0.070	
Business' age	Young	46	-0.269	***	0.080	ns	0.062	ns	0.015	ns
	Mature	172	0.072		-0.021		-0.017		-0.004	
Industry	Service and trade	135	-0.025	ns	-0.124	***	-0.135	***	0.016	ns
	Manufacturing and construction	83	0.040		0.201		0.219		-0.026	
Entrepreneur's age	Young	90	-0.063	ns	-0.115	ns	0.012	ns	0.043	ns
	Senior	128	0.044		0.081		-0.009		-0.030	
Crisis impact	Low	74	0.05	ns	-0.07	ns	-0.55	***	0.02	ns
	High	144	-0.03		0.04		0.28		-0.01	

\*\*\* = p-Value < 0.05.

**Table 4.** t-Test results.

By comparing young and mature firms, a significant difference can be observed with regard to Factor 1. In fact mature firms have scored higher on strategies oriented to *human resources qualification*. No differences exist with regard to other factors. So hypotheses in H2 can be considered partially confirmed. However it must be noted that very young firms – start-ups – are not included in our sample. In fact, only firms founded before the beginning of the crisis (Autumn 2008) are included.

As regards industry, significant differences have been found with regard to Factors 2 and 3. In fact manufacturing firms have scored higher in strategies oriented to growth and to downsizing. This data confirms H3. This result appears contradictory, since growth and downsizing strategies have completely contrasting purposes and content. This result, however, may be the consequence of the different impact of the crisis in the two industries. As stated, in Marche region, the crisis was particularly strong in manufacturing and construction. In this scenario, firms operating in these industries may have been forced to react to the crisis with harder and more focused measures, and to adopt growth or resizing strategies. These strategies, on the contrary, were less frequently adopted by trade and services firms, which aimed more at preserving the status quo: they did not implement growth strategies because the crisis did not allow it; on the other hand they did not adopt downsizing measures because they were not strictly necessary, as the impact of the crisis was lower than in manufacturing and construction.

No significant differences have been found with regard to entrepreneurs' age. This means that young and senior entrepreneurs faced the crisis with similar strategies, regardless of age. So H4 has not been confirmed.

Finally, some significant differences have also been found regarding crisis' impact on businesses, consistently with H5. In fact businesses that suffered the greatest impact of the crisis adopted downsizing strategies more often and with greater intensity than businesses where the impact of the crisis was weaker.

## 5. Conclusions and implications

This paper provides insight into strategies that Italian micro-entrepreneurs adopted to survive the recent economic crisis.

Factor analysis allowed the identification of four strategic profiles: strategy oriented to human resource training (investment in intangible assets); market-oriented strategy (redefining supply and searching for new opportunities); development and growth strategy (focused on sales increasing and on product and process improving) and downsizing strategy (costs reduction, elimination of waste and redefining of core business). Findings suggest that entrepreneurs mainly adopted a defensive approach characterized by restructuring and resizing strategies aimed to improve efficiency and refocus the core business. An offensive approach – realized by innovation, development or reorganization strategies – was less common. The defensive approach characterized both men and women entrepreneurs, although the adoption of offensive strategies was less widespread among women. So we can say that, in front of the same external economic conditions, men and women entrepreneurs made different choice to face the crisis.

Differences in strategies adopted to address the crisis have also been identified with regard to other factors, especially industry and crisis' impact. In particular, some differences have been identified among companies that were differently affected by the crisis. In fact results show that where the impact of the crisis was stronger, businesses needed to "batten down the hatches" and defend themselves from the crisis, mostly through cost cutting measures, while they gave up making new investments, redefined their core business activities and tried to increase the efficiency of remaining activities.

Results from this research provide significant contributions, in the field of both scientific research and of real economy.

From a scientific perspective, data from this investigation contribute to the development of the debate on gender-based differences in behaviors, attitudes and preferences. Men and women entrepreneurs are compared considering a particular economic condition, characterized by recession. Until now, no analyses were carried out to compare the behavior of entrepreneurs of both genders in such situations and this is the first study to address this issue. Moreover, it must be observed that even if several research analyzed factors affecting the choice of strategies to face a crisis, they ignored gender issues.

Data from our analysis allow us to get important information about how men- and women-owned micro-enterprises reacted to economic downturns. Our analysis shows that, under the same external conditions, Italian men and women entrepreneurs adopted different strategies to respond to the economic crisis. In this perspective, results are consistent with those of previous analyses comparing male and female entrepreneurs' behaviors. The defensive strategies mainly adopted by women entrepreneurs, in fact, are consistent with some of their distinguishing characteristics, compared to male entrepreneurs: lower risk orientation, lower preference for conditions of uncertainty, lower growth orientation and less willingness to invest.

In front of these data, we can wonder about the real effectiveness of strategies women entrepreneurs adopted to tackle the economic crisis. Demographic data on birth and mortality rate of Italian firms show that female businesses showed better resistance towards the economic crisis. Therefore we could think that defensive strategies adopted by women have proven to be more effective in addressing the crisis and ensuring the survival of their enterprises. However, our analysis does not allow saying whether female businesses' lower mortality rates are the consequence of the strategies they adopted to face the crisis. Indeed, in the literature on strategies to deal with economic crisis different opinions have been expressed about the effectiveness of defensive strategies. In some cases, it is argued that a defensive strategic approach can be considered positive in the short-term, as it aims at guaranteeing business' survival. However, in the long-term, such an approach may undermine business ability to seize new opportunities and innovate, and consequently weaken business's competitiveness.

For this reason, further analysis should be done to find out if there is a relationship between strategies adopted by male and female businesses and their financial and competitive performance, in the short- and in the long-term.

Results from this research are also useful to understand which economic policy measures may be useful to help men and women entrepreneurs to address the crisis and ensure the survival of their businesses. Policy-makers who want to support female entrepreneurship should consider these aspects, in order to identify tools and policies that can help female firms to resist economic downturns more effectively and to seize new market opportunities in the recovery phase.

This study has important limitations related to the type of business analyzed (only sole proprietors) and to the limited geographical context (only Italian firms from a single region). Results from this investigation, however, may serve as an important basis for international comparisons, in order to understand whether, in different geographical and cultural contexts and with different economic, political and institutional situations, men and women entrepreneurs prove to have the same attitudes and the same behavior of their Italian colleagues.

As regard the role of other variables (business age, industry and crisis' impact) in influencing strategic choices, further analysis should be carried out to understand how they interact with gender in affecting strategic responses to the crisis. In fact, our analysis does not allow us to establish which variable is the most significant in explaining differences in strategies adopted to face the crisis. In particular, further analysis should say if, other things being equal, gender continues to be significant in explaining the different strategies adopted by companies to face up to the crisis.

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## References

- [1] Cerved. Monitor of Bankruptcies, Insolvency Proceedings and Business Closures. 2014. Available from: <http://www.cervedgroup.com/> [Accessed: February 19, 2014]
- [2] Unioncamere. Crisi: le donne rispondono con l'impresa, +4mila in 12 mesi. 2013. Press release. Available from: <http://www.unioncamere.gov.it/Archivio/P45A0C160S123O30/Comunicati-Stampa.htm> [Accessed: February 15, 2014]
- [3] Pilotti L. Le strategie dell'impresa. Roma: Carocci; 2005
- [4] Sciarelli S. Crisi d'impresa. Padova: Cedam; 1995
- [5] Latham S. Contrasting strategic response to economic recession in start-up versus established software firms. *Journal of Small Business Management*. 2009;**47**:180-201. DOI: 10.1111/j.1540-627X.2009.00267.x
- [6] Kitching J, Blackburn R, Smallbone D, Dixon S. Business Strategies and Performance During Difficult Economic Conditions, Kingston University and Bath University. 2009. Available from: <http://eprints.kingston.ac.uk/5852/1/Kitching-J-5852.pdf> [Accessed: March 9, 2014]
- [7] Pellicelli G. Management ritorno al futuro. Strategie aziendali per agganciare la ripresa. Milano: EGEA; 2009
- [8] Thompson AA, Strickland AJ, Gamble JE. Strategia aziendale. Milano: McGraw Hill; 2009
- [9] Sternad D. Adaptive strategies in response to the economic crisis: A cross-cultural study in Austria and Slovenia. *Managing Global Transitions: International Research Journal*. 2012;**10**:257-282
- [10] Cliff JE. Does one size fit all? Exploring the relationship between attitudes towards growth, gender, and business size. *Journal of Business Venturing*. 1998;**13**:523-542. DOI: 10.1016/S0883-9026(97)00071-2
- [11] Byrnes JP, Miller D, Schafer WD. Gender differences in risk taking: A meta-analysis. *Psychological Bulletin*. 1999;**125**:367-383. DOI: 10.1037/0033-2909.125.3.367
- [12] Croson R, Gneezy U. Gender differences in preferences. *Journal of Economic Literature*. 2009;**47**:448-474. DOI: 10.1257/jel.47.2.448
- [13] Pelger I. Male vs. Female Business Owners: Are There Differences in Investment Behavior? Beiträge zur Jahrestagung des Vereins für Socialpolitik 2012: Neue Wege und Herausforderungen für den Arbeitsmarkt des 21. Jahrhunderts. Available from: <http://hdl.handle.net/10419/62016> [Accessed: March 5, 2014]
- [14] Drummond H, Chell E. Crisis management in a small business: A tale of two solicitors' firms. *Management Decision*. 1994;**32**:37-40. DOI: 10.1108/00251749410050688

- [15] Pearce J, Michael S. Marketing strategies that make entrepreneurial firms recession-resistant. *Journal of Business Venturing*. 1997;**12**:301-314. DOI: 10.1016/S0883-9026(97)89449-9
- [16] Dean T, Brown RL, Bamford CE. Differences in large and small firm responses to environmental context: Strategic implications from a comparative analysis of business formations. *Strategic Management Journal*. 1998;**19**:709-723. Available from: <http://www.jstor.org/stable/3094124> [Accessed: March 15, 2014]
- [17] DeDee JK, Vorhies DW. Retrenchment activities of small firms during economic downturn: An empirical investigation. *Journal of Small Business Management*. 1998;**36**:46-61
- [18] Carr JC, Topping S, Burcham M. Health care entrepreneurship in the Nashville region: Societal linkages, change dynamics, and entrepreneurial responses. *Journal of Applied Management and Entrepreneurship*. 2004;**9**:49-64
- [19] Churchill N, Lewis V. Lessons for small business from the recession. *Journal of Small Business Management*. 1984;**22**:5-17
- [20] Shama A. Marketing strategies during recession: A comparison of small and large firms. *Journal of Small Business Management*. 1993;**31**:62-72
- [21] Srinivasan R, Rangaswamy A, Lilien GL. Turning adversity into advantage: Does proactive marketing during a recession pay off? *International Journal of Research in Marketing*. 2005;**22**:109-125. DOI: 10.1016/j.ijresmar.2004.05.002
- [22] Ofek E. Capital structure and firm response to poor performance: An empirical analysis. *Journal of Financial Economics*. 1993;**34**:3-30. DOI: 10.1016/0304-405X(93)90038-D
- [23] Miles RE, Snow CC. *Organizational Strategy, Structure, and Process*. New York: McGraw Hill; 1978
- [24] Chattopadhyay P, Glick WH, Huber GP. Organizational actions in response to threats and opportunities. *Academy of Management Journal*. 2001;**44**:937-955. DOI: 10.2307/3069439
- [25] Papaoikonomou E, Segarra P, Li X. Entrepreneurship in the context of crisis: Identifying barriers and proposing strategies. *International Advances in Economic Research*. 2012;**18**:111-119. DOI: 10.1007/s11294-011-9330-3
- [26] Deans GK. Making a key decision in a downturn: Go on the offensive or be defensive? *Strategic Direction*. 2009;**25**. DOI: 10.1108/sd.2009.05625had.010
- [27] Robbins DK, Pearce JA II. Turnaround: Recovery and retrenchment. *Strategic Management Journal*. 1992;**3**:287-309. DOI: 10.1002/smj.4250130404
- [28] Michael SC, Robbins DK. Retrenchment among small manufacturing firms during recession. *Journal of Small Business Management*. 1998;**36**:35-45
- [29] Sharma S. Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal*. 2000;**43**:681-697. DOI: 10.2307/1556361



- [30] Pencarelli T, Savelli E, Splendiani S. Strategic awareness and growth strategies in small sized enterprises (SEs). *International Journal of Business & Economics*. 2010;**8**:1-43
- [31] Istat. Rapporto sulla competitività dei settori produttivi. 2014. Available from: [www.istat.it/it/files/2014/02/Rapporto-Competitivita-2014.pdf](http://www.istat.it/it/files/2014/02/Rapporto-Competitivita-2014.pdf) [Accessed: September 2, 2014]
- [32] Bigelow R, Chan Peng S. Managing in difficult times: Lessons from the most recent recession. *Management Decision*. 1992;**30**:34-42. DOI: 10.1108/00251749210022186
- [33] Geroski PA, Gregg P. Corporate restructuring in the UK during the recession. *Business Strategy Review*. 1994;**5**:1-19. DOI: 10.1111/j.1467-8616.1994.tb00073.x
- [34] Geroski PA, Gregg P. *Coping with Recession: UK Company Performance in Adversity*. Vol. 38. Cambridge: Cambridge University Press; 1997
- [35] Penrose E. *The Theory of the Growth of the Firm*. 2nd ed. Oxford: Oxford University Press; 1995
- [36] Gratton L. The time is ripe for fresh ideas. *Financial Times, Managing in a Downturn Series*. February 5, 2009. Available from: <http://www.ft.com/reports/managingdownturn> [Accessed: September 2, 2014]
- [37] Brenner B. The value of increasing investment in employee benefits during an economic downturn. *Journal of Financial Service Professionals*. 2009;**63**:29-31
- [38] Roberts K. What strategic investments should you make during a recession to gain competitive advantage in the recovery? *Strategy & Leadership*. 2003;**31**:31-39. DOI: 10.1108/10878570310483960
- [39] Wan WP, Yiu DW. From crisis to opportunity: Environmental jolt, corporate acquisitions, and firm performance. *Strategic Management Journal*. 2009;**30**:791-801. DOI: 10.1002/smj.744
- [40] Chowdhury SD, Lang JR. Turnaround in small firms: An assessment of efficiency strategies. *Journal of Business Research*. 1996;**36**:169-179. DOI: 10.1016/0148-2963(95)00119-0
- [41] Latham S, Braun M. Economic recession, strategy, and performance: A synthesis. *Journal of Strategy and Management*. 2011;**4**:96-115. DOI: 10.1108/17554251111128592
- [42] Penrose JM. The role of perception in crisis planning. *Public Relations Review*. 2000;**26**:155-171
- [43] Arch E. Risk-taking: A motivational basis for sex differences. *Psychological Reports*. 1993;**73**:6-11. DOI: 10.2466/pr0.1993.73.1.3
- [44] Powell M, Ansic D. Gender differences in risk behaviour in financial decision-making: An experimental analysis. *Journal of Economic Psychology*. 1997;**18**:605-628. DOI: 10.1016/S0167-4870(97)00026-3
- [45] Sunden A, Surette B. Gender differences in the allocation of assets in retirement savings plans. *American Economic Association Papers and Proceedings*. 1998;**88**:207-211. Available from: <http://www.jstor.org/stable/116920> [Accessed: July 11, 2014]

- [46] Dohmen T, Falk A. Performance pay and multi-dimensional sorting – Productivity, preferences and gender. *The American Economic Review*. 2011;**101**:556-590
- [47] Rad A, Yazdanfar D, Öhman P. Female and male risk aversion. An empirical study of loan officers' assessment of SME loan applications. *International Journal of Gender and Entrepreneurship*. 2014;**6**:121-141. DOI: 10.1108/IJGE-02-2013-0012
- [48] Fielden SL, Davidson MJ, Dawe AJ, Makin PJ. Factors inhibiting the economic growth of female owned businesses in North West England. *Journal of Small Business and Enterprise Development*. 2003;**10**:152-166. DOI: 10.1108/14626000310473184
- [49] Kirkwood J. Is a lack of self-confidence hindering women entrepreneurs? *International Journal of Gender and Entrepreneurship*. 2009;**1**:118-133. DOI: 10.1108/17566260910969670
- [50] Barber BM, Odean T. Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics*. 2001;**116**:261-292. DOI: 10.1162/003355301556400
- [51] Schubert R, Brown M, Gysler M, Brachinger HW. Financial decision-making: Are women really more risk-averse? *American Economic Association Papers and Proceedings*. 1999;**89**(2):381-385
- [52] Dwyer P, Gilkeson J, List J. Gender differences in revealed risk taking: Evidence from mutual fund investors. *Economics Letters*. 2002;**76**:151-158. DOI: 10.1016/S0165-1765(02)00045-9
- [53] Master R, Meier R. Sex differences and risk-taking propensity of entrepreneurs. *Journal of Small Business Management*. 1988;**26**:31-35
- [54] Scherer RF, Brodzinski JD, Wiebe FA. Entrepreneur career selection and gender: A socialization approach. *Journal of Small Business Management*. 1990;**28**:37-44
- [55] Sexton DL, Bowman-Upton N. Female and male entrepreneurs: Psychological characteristics and their role in gender-related discrimination. *Journal of Business Venturing*. 1990;**5**:29-36. DOI: 10.1016/0883-9026(90)90024-N
- [56] Mitchelmore S, Rowley J, Shiu E. Competencies associated with growth of women-led SMEs. *Journal of Small Business and Enterprise Development*. 2014;**21**:588. DOI: 10.1108/JSBED-01-2012-0001
- [57] Morris MH, Miyasaki NN, Watters CE, Coombes SM. The dilemma of growth: Understanding venture size choices of women entrepreneurs. *Journal of Small Business Management*. 2006;**44**:221-244. DOI: 10.1111/j.1540-627X.2006.00165.x
- [58] Cesaroni FM. Donne imprenditrici e banche. Le ragioni di un rapporto difficile. In: Calcagnini G, Favaretto I, editors. *L'economia della piccola impresa*. Milano: Franco-Angeli; 2010
- [59] Cesaroni FM, Lotti F, Mistrulli PE. Female firms and bank's lending behavior: What happened during the great recession? *Questioni di Economia e Finanza, Occasional Papers*.

2013. Available from: [http://www.bancaditalia.it/pubblicazioni/econo/quest\\_ecofin\\_2/qef177/QEF\\_177.pdf](http://www.bancaditalia.it/pubblicazioni/econo/quest_ecofin_2/qef177/QEF_177.pdf) [Accessed: March 9, 2014]

- [60] Weber PC, Geneste L. Exploring gender-related perceptions of SME success. *International Journal of Gender and Entrepreneurship*. 2014;**6**:15-27. DOI: 10.1108/IJGE-04-2013-0038
- [61] Brush CG. Research on women business owners: Past trends, a new perspective and future directions. *Entrepreneurship Theory & Practice*. 1992;**16**:5-30
- [62] Rosa P, Carter S, Hamilton D. Gender as a determinant of small business performance: Insights from a British study. *Small Business Economics*. 1996;**8**:463-478. DOI: 10.1007/BF00390031
- [63] Buttner EH, Moore DP. Women's organizational exodus to entrepreneurship: Self-reported motivations and correlates with success. *Journal of Small Business Management*. 1997;**35**:34-46
- [64] Collins-Dodd C, Gordon IM, Smart C. Further evidence on the role of gender in financial performance. *Journal of Small Business Management*. 2004;**42**:395-417. DOI: 10.1111/j.1540-627X.2004.00119.x
- [65] Dalborg C, von Friedrichs Y, Wincent J. Beyond the numbers: Qualitative growth in women's businesses. *International Journal of Gender and Entrepreneurship*. 2012;**4**:289-315. DOI: 10.1108/17566261211264163
- [66] Reichborn-Kjennerud K, Svare H. Entrepreneurial growth strategies: The female touch. *International Journal of Gender and Entrepreneurship*. 2014;**6**:181-199. DOI: 10.1108/IJGE-04-2013-0043
- [67] Dalborg C. The life cycle in women-owned businesses: From a qualitative growth perspective. *International Journal of Gender and Entrepreneurship*. 2015;**7**:126-147. DOI: 10.1108/IJGE-06-2014-0019
- [68] Beaver C, Ross C. Recessionary consequences on small business management and business development: The abandonment of strategy? *Strategy Change*. 1999;**8**:251-261
- [69] Ghemawat P. Sustainable advantage. *Harvard Business Review*. 1986;**64**:53-58
- [70] Banca d'Italia (2009, 2010, 2011, 2012, 2013, 2014), *Economie regionali. L'economia delle Marche. Aggiornamento congiunturale*. Vol. 1986. Available from: <https://www.bancaditalia.it/pubblicazioni/economie-regionali> [Accessed: April 30, 2015]
- [71] Hair JF, Anderson RE, Tatham RL, Black WC. *Multivariate Data Analysis*. New Jersey: Prentice Hall; 1998
- [72] Zwick WR, Velicer WF. Comparison of five rules for determining the number of components to retain. *Psychological Bulletin*. 1986;**99**:432-442. DOI: 10.1037/0033-2909.99.3.432
- [73] McCain KW. Mapping authors in intellectual space: A technical overview. *Journal of the American Society for Information Science*. 1990;**41**:433-443