

# Factors Influencing Entrepreneurial Process and Firm Start-Ups: Evidence from Central Greece

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**Abstract** Over the last two decades, technological changes have reformed business environment and made entrepreneurial activity as the main channel behind knowledge spillovers and knowledge creation. Therefore, the factors affecting entrepreneurial activity will indirectly affect knowledge transmission. This paper examines those factors influencing the entrepreneurial process by analyzing the results of 164 questionnaires distributed in the region of Thessaly (central Greece). In addition, by using nonparametric techniques, this paper establishes three different factors that appear to have dominant influence on the entrepreneurial process. The first factor is related to entrepreneurial skills, education, and previous experience, whereas the second factor is related to issues regarded desire of independence and locus of control. Finally, the third factor, which influences the entrepreneurial activity, is related to the access of capital, to social aspects, and to regions' institutional environment.

**Keywords** Entrepreneurship · Business formation · Entrepreneurial process · Nonparametric analysis

## Introduction

The link between economic development and firm creation has extensively attracted the attention of the economic literature [1–4]. During the 1980s, several authors suggested that knowledge creation processes are related to large firms only due to

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increased costs associated with them, and therefore, a large scale was required to compete successfully globally [5, 6]. However, technology changes over the years introduced new business conditions which made scale economies to be less important enabling entrepreneurial economy to rise [7]. In fact, knowledge-based economy was the main driver behind the rise of entrepreneurial activity [8]. Even earlier literature [9] asserts that, given certain assumptions about the characteristics of knowledge and the knowledge requirements of production, the firm is conceptualized as an institution for integrating the specialist knowledge of its members. Knowledge is viewed as residing within the individual, and the primary role of the organization is knowledge application rather than knowledge creation.<sup>1</sup> In addition, economic literature considers knowledge to be the “missing” factor in endogenous growth models [10–12] and entrepreneurial capital the “missing” link behind economic performance [13]. Entrepreneurial capital influences economic performance by creating knowledge spillovers [14], by increasing knowledge externalities [15–17] and by developing firm and knowledge diversity [18] making thus cities and firms vital sources of innovation [15, 19]. Therefore, entrepreneurial activity is one of the main channels behind knowledge spillovers and knowledge creation, so it becomes a major driver of the knowledge economy [20]. It seems that factors influencing directly entrepreneurial activity will have an indirect impact on the transmission of knowledge and knowledge creation.

This paper focuses on the factors influencing the relation between entrepreneurial action and new business formation. It highlights different empirical results from studies in different countries, and in an effort to establish some norms of behavior, it concentrates on the analysis of motives and characteristics of entrepreneurs that have started their businesses in the region of Thessaly in Greece. To this end, the paper uses nonparametric techniques to illustrate different results from a primary research, conducted by the authors in this area. To develop our arguments, we assume that entrepreneurial actions and hence entrepreneurial processes are the results of both motivational and cognitive factors, like ability, intelligence, and skills.

## Literature Review

The relevant literature reviewed below clearly shows the great variability and the large spectrum of factors presented by the various studies on the topic reflecting the inability of researchers to isolate any one of them as the most important. This has raised obstacles in building a model for entrepreneurship behavior especially when

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<sup>1</sup> The emerging “knowledge-based view” on firms’ creation represents a confluence of long-established interests in uncertainty and information with several streams of newer thinking about the firm. It considers knowledge as the most strategically important of the firm’s resources, so it is an extension of the resource-based view. At the same time, knowledge is central to several quite distinct research traditions, notably *organizational learning*, the *management of technology*, and *managerial cognition*. The issues with which the knowledge-based view concerns itself extend beyond the traditional concerns of strategic management, strategic choice, and competitive advantage, and address some other fundamental concerns of the theory of the firm, notably the nature of coordination within the firm, organizational structure, the role of management and the allocation of decision-making rights, determinants of firm boundaries, and the theory of innovation [9]

research is confined at the early staged of businesses set up, and therefore, this explains the instability of the existing models.

Audretsch et al. [21] specify several factors to influence entrepreneurial activity and behavior, and these are subject to regional and sectoral characteristics.<sup>2</sup> Some other authors insist on individual factors like local culture [24], regional innovation networks [25–27], risk-taking behavior, motivation, personal characteristics [28, 29], governmental policies [5], and familiarity with the sector [30] because “a person working in an industry is more likely to identify a market gap” [31, p. 229]. Johnson and Cathcart [32] provide evidence that more than 57% of the founders of manufacturing firms have started their business in the same sector in which they were formerly employed. In addition, similar evidence has been provided for Scotland [33],<sup>3</sup> Cleveland, Durham, Tyne and Wear [34], Nottingham [35], and Merseyside, Greater Manchester, and South Hampshire [36].

Cross [33] points on the level of skills possessed by individuals that influences the rate of new firm formation. Lloyd and Mason [36] provide evidence that skilled workers are more prone to create their own firms compared to the semi-skilled or unskilled ones. In addition, Cross [33] maintains that the propensity for self-employment is higher for individuals with previous managerial experience. Gudgin et al. [37] relate managerial experience to educational attainment, and Storey [34] recognizes that managerial experience and higher levels of education can be directly associated with higher levels of entrepreneurship. Furthermore, it appears that these qualifications and managerial expertise are related to successful firm creation [36–38].

Gudgin et al. [37] find differences between the performance of graduates and nondegree holders. Lloyd and Mason [36] provide evidence that faster growing firms are created by entrepreneurs with managerial experience and some degree level qualification, while Storey [34] argues that this relationship holds only in the manufacturing sector. Moreover, Gould and Keeble [39] provide evidence of positive correlation between new firm formation and the percentage of the resident male population in nonmanual occupations. Similar findings for Britain are presented by Westhead and Moyes [40] linking the previous employment together with managerial and professional expertise with firm formation.

Furthermore, Johnson and Cathcart [32] found that 22% of the entrepreneurs were previously employed in the services sector, and Cross [33] and Storey [34] assure that the corresponding proportions are 28% and 16%, respectively. Taking another point of view firm creation is not associated with industrial workers in France [41]. The same holds true for the case of manual workers in UK economy [42, 43], Germany [44], and Sweden [45]. For the case of UK, further findings provide that the degree of managerial background has a strong positive effect on spatial variations in firm formation [46] and a similar argument in [47]. Similarly, Hart and Gudgin [48] provide evidence for Ireland showing a positive correlation between variations in new firm creation and the proportion of county population with

<sup>2</sup> Parts from the literature are based on Fotopoulos [22]. For an extensive literature review on the subject matter, see also Vliamos *et al.* [23].

<sup>3</sup> The degree of sectoral inertial found in Cross' survey for Scotland is somewhat lower (39%) than that reported in Storey [34] for Cleveland (60%).

managerial and professional occupation. Contrary to these findings, Guesnier [49] found, for the case of France, the existence of positive effects on local firm births with no differentiation between the proportions of entrepreneurs from workforce, from bachelor degree holders, or middle management workforce.

Mason [50] considers capital accessibility based on personal and institutional finance as the leading factor for new firm formation. Within this line of argument, Storey [34] provides evidence that more than 52% of the financial sources needed are based on personal savings and that only 27% of surveyed new firms declare that a bank loan is the most important source of finance (“level of wealth in the local community must therefore be an important determinant of its capacity to add its stock of business” [34, p. 164]). Similar findings are provided for the case of Scotland [33] and South Hampshire, UK [50].

Finally, economic literature considers gender differentiation as another major factor determining entrepreneurial process. Scott shows [51] that women are forming their own business because they look at it as a personal challenge and satisfaction whereas men have the desire to be their own bosses, and Kaplan [52] accepts that motivation among women to start a business depends on age and kind of previous employment. Pellegrino and Reece [53] relate women willingness to create businesses to start-up funds availability, financial management, and development of effective marketing and advertising [54]. In line of these, Buttner and Rosen [55] present the existence of stereotypes regarding gender differentiation and therefore the lending institutions that perceived women business owners to be less successful than men. Furthermore, Loscosso and Robinson [56] have reported that the lack of access to capital and the inability to secure government contracts were the main reason of lower sales volumes and lower incomes on women-owned businesses. However, Kolvereid et al. [57] conclude that differences between male and female entrepreneurs are been attributed to different country-specific characteristics which are deriving from countries' institutional and social contexts rather than gender differentiation.

## Methodology and Data

A questionnaire was distributed to the owners of the 692 new firms<sup>4</sup> established in the region during the year of 2005–2007, operating in the manufacturing, wholesale food and services sectors, which have started operating between January 1, 2002–December 31, 2002 in the region of Thessaly (central Greece). Only 164 firms responded, i.e. 23.6%. The variables obtained from the questionnaires are illustrated in the [Appendix](#). The main purpose behind the questionnaire was to capture the factors determining entrepreneurial processes and firms' formation, so the questions were based upon the existing literature exposed in the previous section. Information regarding the background of the entrepreneur, the problems faced to start-up businesses, and the description of the process were vital for the research and viability of our findings. However, the most important variables (the depended variables in a regression context) for our analysis are related to the gender of the entrepreneurs

<sup>4</sup> According to the local chambers of commerce of Prefectures of Magnesia, Larisa, Trikala, and Karditsa.

(Gender) and the “easiness” of the entrepreneurial process (Easin).<sup>5</sup> Several nonparametric techniques have been applied to analyze the data obtained from the questionnaires. According to Agresti [58] and Halkos [59], in a two-way table, the null hypotheses  $H_0$  indicate that cell probabilities equal certain fixed values  $\pi_{ij}$ . For instance, when having a sample  $n$  with cell counts  $n_{ij}$ , the values  $\mu_{ij} = n\pi_{ij}$  are called expected frequencies. They represent the values of the expectations  $E(n_{ij})$  when  $H_0$  is true. The Pearson chi-square statistic for testing  $H_0$  can be calculated as:

$$X^2 = \sum \frac{(n_{ij} - \mu_{ij})^2}{\mu_{ij}} \quad (1)$$

This statistic takes a minimum value of zero when  $n_{ij} = \mu_{ij}$ . For fixed sample size, greater differences between  $n_{ij}$  and  $\mu_{ij}$  produce larger  $X^2$  values and stronger evidence against  $H_0$ . The  $X^2$  statistic has approximately a chi-square distribution for a large sample sizes.<sup>6</sup>

In addition to  $X^2$  test, an alternative test can be applied for testing  $H_0$  results from the likelihood-ratio method for significance tests. The test is based on the ratio of the maximized likelihoods. The test statistic equals to  $-2\log(\Lambda)$ , where  $\Lambda(x) = \frac{f(x|\theta_0)}{f(x|\theta_1)}$ , when  $H_0: \theta = \theta_0, H_1: \theta = \theta_1$ . If the  $\Lambda$  ratio is far below 1, then there is strong evidence for rejecting  $H_0$ . In addition, the  $\Lambda$  ratio cannot take values greater than 1 [58]. The reason for the log transform is to yield approximate chi-square sampling distribution. For two-way contingency tables, the formula for calculating this statistic is:

$$G^2 = 2 \sum n_{ij} \log \left( \frac{n_{ij}}{\mu_{ij}} \right) \quad (2)$$

Like the Pearson statistic,  $G^2$  takes its minimum value of 0 when all  $n_{ij} = \mu_{ij}$ , and larger values provide stronger evidence against  $H_0$ . The two ratios (1) and (2) provide separate statistic, and according to Agresti [58], they share many properties and commonly yield the same conclusions. When  $H_0$  is true and the sample cell counts are large, the two statistics have the same chi-square distribution, and their numerical values are similar. If the statistic tests are significant, then the values in the cells of the table are influenced by the cell-specific determinants. Thus, the two dimensions of the table are not independent. According to Simonoff [60], the  $X^2$  test and the likelihood ratio  $G^2$  test for the independence model are a first step when analyzing contingency tables. In addition, we can take the advantage of the natural ordering of the categories of the tables by smoothing counts over the neighboring cells [60, p. 43]. Therefore, in order to analyze more the factors influencing the entrepreneurial process, we apply the approach proposed by Aitchison and Aitken [61] for smoothing the discrete variables of our questionnaire in a nonparametric local constant regression [62, 63] context.<sup>7</sup> Following the notation by Racine et al.

<sup>5</sup> The “Easin” variable is based on a deterministic (rigid) response (i.e., dummy variable taking the value of one if the process of business formation was easy, zero otherwise). This answer type has been chosen in purpose (instead of a Likert-type scale response) giving us more rigid response on the influence of the examined factors on the entrepreneurial process.

<sup>6</sup> According to Agresti [58], when  $\mu_{ij} \geq 5$ , it is sufficient.

<sup>7</sup> For an extension for the case of both discrete and continuous variable, see Li and Racine [64], Racine and Li [65], Li and Quyang [66], and Li and Racine [67].

[68, p. 218],  $Z^d = (X^d, Y^d)$  denotes a vector of random discrete variables. Then, a nonparametric regression model can be written as  $Y_i^d = g(X_i^d) + u_i$ , where  $g(\cdot)$  is of unknown form and  $Z_{t,i}^d$  takes  $c_t \geq 2$  different values,  $Z_{t,i}^d \in \{0, 1, \dots, c_t - 1\}$ ,  $t = 1, \dots, k$ . Furthermore,  $D_z = \prod_{t=1}^k \{0, 1, \dots, c_t - 1\}$  denotes the range assumed by  $Z_i^d$ , for  $Z_i^d, Z_j^d \in D_z$ . Then, by following Aitchison and Aitken [61],  $g(X_i^d)$  can be estimated by a univariate kernel function as:

$$l(Z_{t,i}^d, Z_{t,j}^d, \lambda) = \begin{cases} 1 - \lambda & \text{if } Z_{t,i}^d = Z_{t,j}^d \\ \lambda / (c_t - 1) & \text{if } Z_{t,i}^d \neq Z_{t,j}^d \end{cases} \tag{3}$$

Then, we can define an indicator function  $I(Z_{t,i}^d \neq Z_{t,j}^d)$ , which takes the value 1 if  $Z_{t,i}^d \neq Z_{t,j}^d$  and 0 otherwise. Also, we can define  $d_{z_i, z_j} = \sum_{t=1}^k I(Z_{t,i}^d \neq Z_{t,j}^d)$ , which equals the number of disagreement components between  $Z_i^d$  and  $Z_j^d$ . Then, the product kernel for the discrete variables can be defined as:

$$L(Z_i^d, Z_j^d, \lambda) = \prod_{t=1}^k l(Z_{t,i}^d, Z_{t,j}^d, \lambda) = c_0 (1 - \lambda)^{k - d_{z_i, z_j}} \lambda^{d_{z_i, z_j}} \tag{4}$$

where  $c_0 = \prod_{l=1}^k I(Z_{l,i}^d \neq Z_{l,j}^d) / (c_l - 1)$ . Then, the product kernels for  $L(X_i^d, X_j^d, \lambda)$  and  $L(Y_i^d, Y_j^d, \lambda)$  are similarly defined. Since the discrete variables used in this study have some natural ordering, we use a kernel weight function suggested by Aitchison and Aitken [61, p. 29] as:

$$l(Z_{t,i}^d, Z_{t,j}^d, \lambda) = c(c_t, s) \lambda^s (1 - \lambda)^{c_t - s} \tag{5}$$

$$\text{when } |Z_{t,i}^d - Z_{t,j}^d| = s (0 \leq s \leq c_t) \text{ where } c(c_t, s) = c_t! / [s!(c_t - s)!] \tag{6}$$

Finally, the smoothing parameter(s)  $\lambda$  have been chosen based on the cross-validation method described in Li and Racine [64], Racine and Li [65], and Li and Racine [67]. Finally, according to Racine [69], an alternative  $R^2$  for a measure of goodness of fit for nonparametric regression, which can be applied to any linear or nonlinear model, can be expressed as:

$$R^2 = \frac{\left[ \sum_{i=1}^n (Y_i - \bar{y}) (\hat{Y}_i - \bar{y}) \right]^2}{\sum_{i=1}^n (Y_i - \bar{y})^2 \sum_{i=1}^n (\hat{Y}_i - \bar{y})^2} \tag{7}$$

### Empirical Results

Table 1 below presents Pearson chi-square and likelihood ratio results among gender differences and easiness of setting-up a business, against other factors which determine the entrepreneurial process. These factors have been presented in the literature review above. Table 2 shows the results obtained of the univariate nonparametric regressions

**Table 1** Pearson's chi-square and likelihood ratio results between easiness of firm creation process and gender against the rest of the variables

vs	Pearson chi-square Easin	Likelihood ratio	vs	Pearson chi-square Gender	Likelihood ratio
<i>Gender</i>	3.43*	3.43*	<i>Start_up</i>	5.09**	4.94**
<i>Start_up</i>	9.01***	9.18***	<i>Age</i>	4.19**	4.88**
<i>Age</i>	0.51	0.5	<i>Edu_Leve</i>	6.72**	7.28**
<i>Edu_Leve</i>	15.38***	15.89***	<i>Pos_Bef</i>	1.69	1.73
<i>Pos_Bef</i>	0.65	0.65	<i>Profitab</i>	5.14*	5.89*
<i>Finance</i>	8.65**	8.72**	<i>Own_Boss</i>	7.71*	7.62*
<i>Own_Boss</i>	10.89**	11.44**	<i>Family_i</i>	47.18***	50.2***
<i>Family_i</i>	9.97**	11.65**	<i>instit_u_env</i>	2.88*	2.89*
<i>instit_u_env</i>	7.78***	10.24***	<i>Finance</i>	6.16	5.17

\*<0.1; \*\*<0.05; \*\*\*<0.001 (levels of significance)

having as dependent variable the *easiness*<sup>8</sup> and *gender differences* against other factors (see also [Appendix](#)). Furthermore, Figs. 1 and 2 provide the nonparametric regression plots derived from the analysis alongside with the bootstrap error bounds.

Looking at the results in Tables 1 and 2, it appears that both *easiness* of the whole process to start a business and *gender differences* have an impact on entrepreneurship action. The findings, in support to the current relevant literature [53], indicate that easiness and gender differences appear to be significant in start-up process. Men believe that the process of new business formation is easier contrary to what women believe, maybe because the former have easier access to various institutional arrangements and other social relations. An additional indication to this is that females start their businesses without business partners contrary to males, who prefer to start them with other participants ( $\chi^2=5.09$ ,  $G^2=4.94$ , Fig. 2a) and succeed in doing so. Actually, the findings indicate that this process is much easier when it is carried out by more than one entrepreneur ( $\chi^2=9.01$ ,  $G^2=9.18$ , Fig. 1b). Women think that the problems they have to face are severe and difficult to solve, maybe due to lack of experience and a satisfactory educational level (Fig. 1a). In particular, our findings in relation to all variables are as follows:

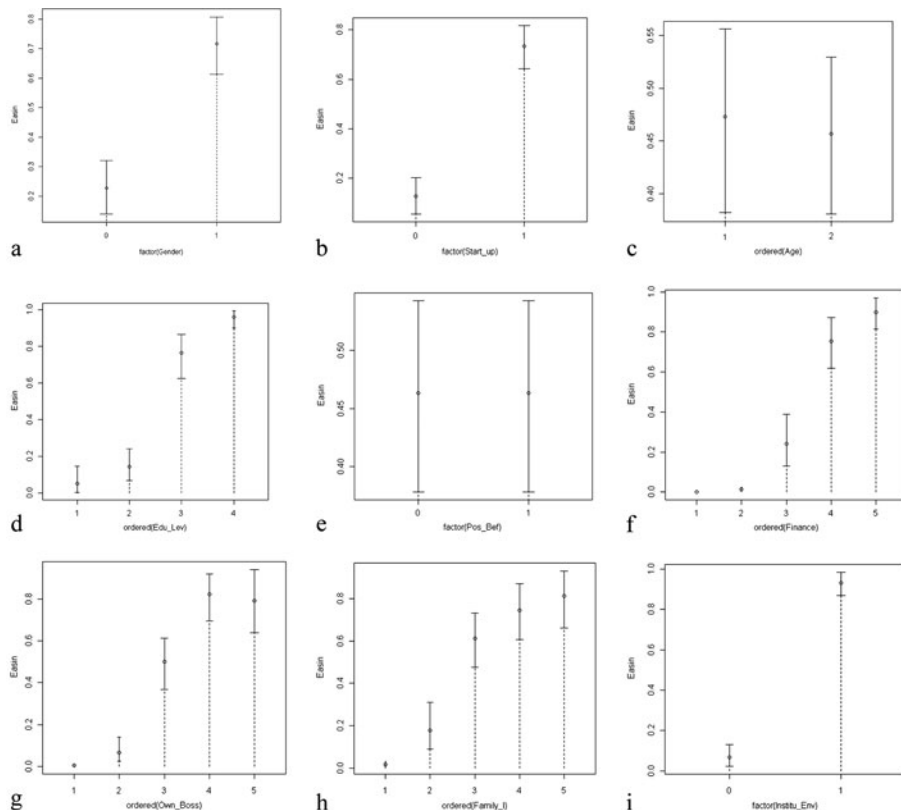
1. The age factor. It appears to be an influential factor (Table 1) that differentiates gender ( $\chi^2=4.19$ ,  $G^2=4.88$ ). Generally, younger entrepreneurs find easier to start a new business as compared to the older ones (Fig. 1c), although female entrepreneurs are younger compared to their male colleagues. In fact, this result supports Kaplan's findings which imply that age is an important factor for female entrepreneurship [52].

<sup>8</sup> This variable was proxied by a dummy (0 and 1), and it was constructed by the answers given by the entrepreneurs referring to how easy the starting-up process has been. Therefore, it is a very subjective and complex variable and refers to all those means (institutions, family support, financial accessibility, education) that make entrepreneurs' lives easier and them more eager to proceed.

**Table 2** Results of the nonparametric regressions

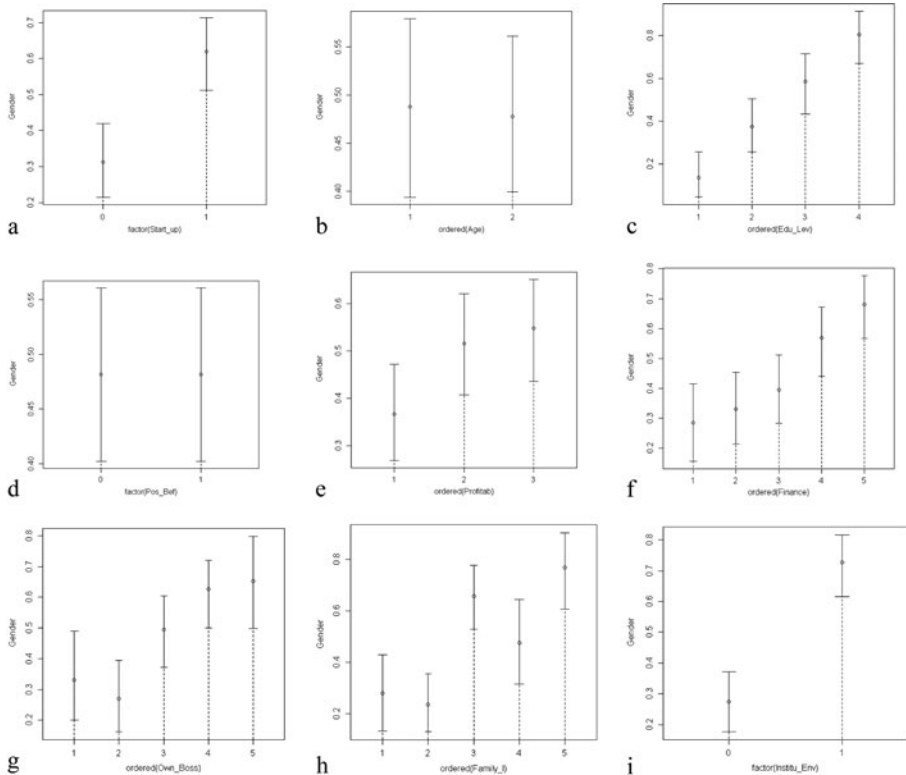
Easin				Gender			
vs	Bandwidth	R <sup>2</sup>	Residual standard error		Bandwidth	R <sup>2</sup>	Residual standard error
<i>Gender</i>	0.00936	0.24899	0.18677	<i>Start_up</i>	0.02536	0.10449	0.22365
<i>Start_up</i>	0.00470	0.37321	0.15587	<i>Age</i>	0.99845	0.00104	0.24954
<i>Age</i>	0.99845	0.00262	0.24834	<i>Edu_Lev</i>	0.09784	0.19581	0.20108
<i>Edu_Lev</i>	0.02923	0.55360	0.11105	<i>Pos_Bef</i>	0.49922	0.00005	0.24967
<i>Pos_Bef</i>	0.49922	0.00392	0.24866	<i>Profitab</i>	0.32915	0.04266	0.23976
<i>Finance</i>	0.08791	0.60687	0.09787	<i>Finance</i>	0.36514	0.13566	0.21690
<i>Own_Boss</i>	0.07375	0.46080	0.13420	<i>Own_Boss</i>	0.26414	0.11959	0.22071
<i>Family_I</i>	0.13827	0.43068	0.14187	<i>Family_I</i>	0.09796	0.19811	0.20049
<i>Institu_Env</i>	0.00040	0.74836	0.06257	<i>Institu_Env</i>	0.01120	0.21371	0.19634

2. Education. Education is an important determinant ( $\chi^2=15.38$ ,  $G^2=15.89$ ). Additionally, regression analysis indicates a clear positive relationship between the level of education and the easiness of forming a new business (Fig. 1g)



**Fig. 1** Nonparametric regression plots and bootstrapped error bounds between “Easin” and the rest of variables





**Fig. 2** Nonparametric regression plots and bootstrapped error bounds between “Gender” and the rest of variables

because higher education levels go hand-in-hand with managerial and high-level entrepreneurship [34, 36–38]. A remarkable result is again that gender matters: female entrepreneurs have different educational background from male entrepreneurs ( $\chi^2=6.72$ ,  $G^2=7.28$ ). Males are having higher qualifications as compared to females (Fig. 2c). One might relate these findings to the previous ones which indicate that female entrepreneurs are younger compared to their male colleagues. This means that those women, who enter the market as entrepreneurs, do it immediately after school, and they do not allow themselves much time to improve their education.

3. Level of independence (being own “bosses”). This holds true for male entrepreneurs, while it is not so for females (Figs. 1g and 2g,  $\chi^2=10.89$ ,  $G^2=11.44$ ).
4. Family environment. It affects entrepreneurial process and firm creation (Fig. 1h,  $\chi^2=9.97$ ,  $G^2=11.65$ ), in a rather nonexplicable manner: It does not affect genders the same way ( $\chi^2=47.18$ ,  $G^2=50.2$ ). Female entrepreneurs seem not to be influenced by their families at the same degree as males (Fig. 2h).
5. Institutional environment. This factor, as expected, appears to have a clear positive impact on business start-ups ( $\chi^2=7.78$ ,  $G^2=10.24$ , Fig. 1i), and it resembles to Malecki’s [70] view that local availability of venture capital networks is an important factor of entrepreneurial environment: Female entrepreneurs think that the institutional environment has not been very helpful

- (and friendly) to them to start a business as compared to their male colleagues (Fig. 2i,  $\chi^2=2.88$ ,  $G^2=2.89$ ). Considering that access to financial sources makes things easier for business formation ( $\chi^2=8.65$ ,  $G^2=8.72$ , Fig. 1f), this can be attributed to the existence of social (and financial) stereotypes regarding gender differentiation [53]. Recall that several studies have stressed the importance of personal finance and financial sources for firm formation [31, 34, 36].
6. Previous work experience. This factor does not have any impact at all on the entrepreneurial process (Fig. 1e). It may be due to the fact that most of the entrepreneurs who were interviewed were unemployed before and therefore they might consider the business creation as an alternative to their unemployment (i.e., they were need entrepreneurs).
  7. Profitability levels. This variable differs between the firms owned from male and female entrepreneurs ( $\chi^2=5.14$ ,  $G^2=5.89$ , Fig. 2e). Firms owned by male entrepreneurs are more profitable as compared to firms owned by females. An explanation to this is that women entrepreneurs are facing start-up problems regarding financial management, securing of start-up funds (gender-stereotype problems pointed out above), and difficulties in developing effective marketing and advertising practices due to low education and vocational levels [51, 53], ( $\chi^2=7.71$ ,  $G^2=7.62$ ). Furthermore, by considering the variables examined above by the value of  $R^2$  in Table 2, we can classify their impact on the entrepreneurial process. The three most influential factors are the *institutional environment* ( $R^2=0.75$ ), *the availability of finance* ( $R^2=0.60$ ), and *the entrepreneurs' educational level* ( $R^2=0.55$ ). Finally, by looking at the  $R^2$  values in Table 2, we classify the three factors which are differentiated more between males and females: *the institutional environment* ( $R^2=0.21$ ), *the influence of family* ( $R^2=0.19$ ), and *the entrepreneurs' educational level* ( $R^2=0.19$ ).

## Conclusions and Policy Implications

Recent research on entrepreneurship has focused largely on macro-level environmental forces [71] and the characteristics of entrepreneurial opportunities [72]. This focus has greatly enhanced our understanding of entrepreneurial activity. However, it lacks an emphasis on knowledge factors. Indeed, knowledge is produced in stages through a set of sequel steps (a methodology called evolutionary epistemology), and as such, it is a key element for the entrepreneurial strategy and firm creation and survival. As the actor (entrepreneur) survives and proceeds, more knowledge is produced through the environment at a cumulative process [73]. So, entrepreneurial process in general and entrepreneurial strategy in particular are interrelated to the evolution of knowledge obtained. Campbell [74] asserts that at the lowest level, the processes that generate potential new knowledge are blind (no foresight and foreknowledge about what they will find). Blind trials result to the exclusion of bad ones and the retention of good ones. In the case of good ones, new trials do not have to be blind any more since now new specific knowledge is required internally to increase the knowledge already acquired. In the opposite case, the external environment will dictate it. In other words, knowledge plays the role of the selector, i.e., it determines processes and strategies to be taken, before the

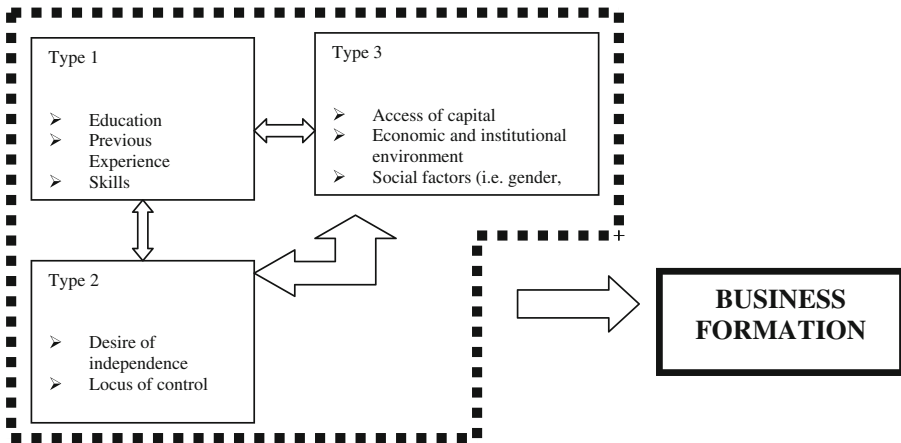
environment fulfills this task vicariously. At a higher hierarchical level, a retained selector itself can undergo variation and selection by another selector, allowing for the development of multilevel cognitive organization leading to even more intelligent and adaptive systems.

Thus, as it happens with most human behavior, entrepreneurial attitude is shaped by personal attributes mostly acquired by knowledge (internal factors) and environment (external factors) [23, 75]. The old belief that there have been real differences between entrepreneurs and nonentrepreneurs is not valid any more. Today, we accept that there is no neat set of behavioral attributes that separate entrepreneurs from nonentrepreneurs. Characteristics describing personal attitudes, such as achievement, higher locus of control (independence), decisiveness, determination, and others that describe environmental (external) factors on the other, such as high educational level, specialization after vocational training studies, persuasion, experience, and other knowledge-developing and knowledge-consuming factors, play an important role. So, internal and external factors based on knowledge production and development consist what has been called the Reflective Judgment Model [76–78].

The present paper insists on the view that since entrepreneurial activity depends on the decision that people make, then the attributes of the decision makers should influence the entrepreneurial process. Although researchers have analyzed and criticized much of the existing empirical research on the role of human motivation in entrepreneurship [79, 80], we believe that the development of an entrepreneurship theory requires consideration of the motivations of people making entrepreneurial decisions. So, it is clear that different factors affect entrepreneurs in making up their decision to start new businesses. They are graphically illustrated below:

So, we identify three types of different factors which help people to develop their ideas and start a business (Fig. 3). Type 1 factors (acquired factors) include different skills, previous experience, and educational achievements that they have obtained over the years, i.e., knowledge-based considerations. Their importance is also identified and stressed by many researchers in the past, and there has been evidence that these factors outweigh opportunism-related ones [81]. This implies that knowledge-based factors should be taken into account in any future study on current organizational innovations and trends which determine new management practices. Type 2 factors (behavioral factors) concern the human motivations that psychologists have shown to influence many aspects of human behavior such as desire for independence and locus of control. Type 3 factors (direct/indirect environment related factors) include all motives and incentives stemming from the environment, which surrounds individuals; these are accessibility to capital, economic environment (i.e., level of economic activity), and social environment such as family, gender, or other direct social influence. After all, as the sociologists agree, motivated entrepreneurs are important to the entrepreneurial process.

The present research adds a descriptive view and contributes to the understanding of the entrepreneurial process, showing the significant of knowledge in shaping up entrepreneurs' will and ideas. In that sense, it supports the knowledge-based view for business start-ups despite the weaknesses it bears in terms of the sample size.



**Fig. 3** Conceptual model of factors affecting entrepreneurial process and business formation

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## Appendix

### Description of variables and variable codes

Variables codes	Definition of variables
Gender	Dummy, taking the value of one if the entrepreneur is male. Zero for female.
Start_up	Dummy, taking the value of one if the entrepreneur has started its business with other participant(s). Zero otherwise.
Age	Takes three values from 1 to 3 in a categorical relationship. One implies the age of the entrepreneur with <=25 years old, two is representing the ages from 26 to 45 years old and three for ages >=46 years old
Edu_Lev	Takes four values from 1 to 4 in a categorical relationship. The value of one represents entrepreneurs with no official certificate of any level of education and the entrepreneurs with primary education but with no official certificate of secondary education. The value of two represents the entrepreneurs with a certificate of primary and secondary school level. Finally, value three represents vocational training and value four university education.
Pos_Bef	Dummy, taking the value of one if the entrepreneur was unemployed before business creation. Zero otherwise.
Profitab	Takes three values from 1 to 3 in a categorical relationship. One implies that the business so far has a negative profitability; two when business has neither positive or negative profitability and three when business has positive profitability.
Finance	Takes five values from 1 to 5 in a categorical relationship. The value of one represents that access to financial resources was unimportant when started the business up to five which represents that was extremely important.

Own_Boss	Takes five values from 1 to 5 in a categorical relationship. The value of one represents that being the owner (own boss) was unimportant when started the business up to five which represents that was extremely important.
Family_I	Takes five values from 1 to 5 in a categorical relationship. The value of one represents that the influence of the family was unimportant when started the business up to five which represents that was extremely important.
Easin	Dummy, taking the value of one if the process of business formation was easy. Zero otherwise.
Institu_Env	Dummy, taking the value of one if the institutional environment was supportive to the business formation process. Zero otherwise.

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