The determinants of the growth expectations of the early-stage entrepreneurs (TEA) using the ordinal logistic model (OLM): the case of Turkey

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THE DETERMINANTS OF THE GROWTH EXPECTATIONS OF THE EARLY-STAGE ENTREPRENEURS (TEA) USING THE ORDINAL LOGISTIC MODEL (OLM): THE CASE OF TURKEY

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ABSTRACT: This study uses the Ordinal Logistic Model (OLM) to analyze the determinants of the growth expectations of total early-stage entrepreneurship activity (TEA) expressed in terms of new jobs to be created within their firms in four categories. Specifically, given the increasing importance of entrepreneurship in job creation, innovation and economic growth, we try to inquire into the question of why some of the new entrepreneurs and not the others expect a rapid development of their ventures. The data from the Global Entrepreneurship Monitor (GEM) for the years 2006-2008 for Turkey were employed. Our findings indicate that the personal characteristics of the early-stage Turkish entrepreneurs such as gender, education and household income, in addition to their motivation and current size of their businesses are important factors in resolving the prevalence of high-expectation new firms. Moreover, some scenarios particular to some sub-groups or population cells of Turkish developing entrepreneurs which may create the bulk of high-expectation entrepreneurial pursuit were conducted using OLM. As far as the policy implications are concerned, the availability and access of capital funding to early-stage entrepreneurs and an education system more relevant to today's competitive world might both contribute better to Turkish economy's prosperity, and seems to be very important for policy considerations.

1. INTRODUCTION

The subject of entrepreneurship has attracted much attention during the last three decades. Its promotion is not only necessary for a healthy economy but also critical for sustaining prosperity, creation of new jobs and thereby in reducing the rate of unemployment. With regard to job creation it is not new firms that are intrinsically the key, but the relatively small number of fast-growing ones which create a big share of jobs in new firms (Autio, 2005). High-growth firms contribute more to the economic growth than do small and new firms in general (Friar and Meyer, 2003; Pages et al. 2003; Wong et al. 2005). Therefore, high-growth firms are prominent on the agenda of policy-makers (Smallbone et al. 2002; European Commission 2003).

Although the high-growth aspiration entrepreneurial activity is responsible for the bulk of expected new jobs by early-stage entrepreneurs, it represents only a small proportion of all venturing activity. In other words, a small part of new entrepreneurs have high expectations, but the economic potential in this area is notably important, since a major portion of total jobs expected to be generated by all entrepreneurs is due to high-growth expectation start-up entrepreneurs. In the world, high income countries appear to exhibit higher entrepreneurial growth ambition compared to those of middle and low income countries according to the Global Entrepreneurship Monitor (GEM) data (Autio, 2005). However, Turkey happens to be a notable exception to this overall pattern where about 27 percent of all early-stage entrepreneurs expect a rapid growth. The high growth expectations of a typical early-stage Turkish entrepreneur are found to be higher than those of an average entrepreneur participating in GEM surveys in 42 counties. This result ranks Turkey in the 4th place among these countries in the year of 2008.

Therefore, this study focuses specifically on high expectations of early-stage Turkish entrepreneurs from the perspective of their ambition in job generation. It is important to note that the expectations of these start-up entrepreneurs represent their initial ambition related to the sizes of their firms rather than their realized job creation. While not all expectations come true, growth aspiration has been shown to forecast eventual growth quite well (Autio, 2005).

In this paper, the data from the Adult Population Survey (APS) of the Global Entrepreneurship Monitor (GEM) project for Turkey for the years 2006-2008 were merged into one dataset to be able to determine the factors of the growth ambition of Turkish early-stage entrepreneurs using the Ordinal Logistic Model (OLM). To the best of our knowledge, the OLM has not been used so far in estimating GEM data. However, Zwan, Thurik and Grilo (2007) used this model to analyze the determinants of entrepreneurial activity based on the Flash Eurobarometer Survey data.

The paper is organized as follows. In section 2, the theoretical literature on the factors which affect the presence of ambitious entrepreneurs who expect growths of their firms is examined and our hypotheses are developed. Section 3 explains the data and defines the variables used in this study. In Section 4, the Ordinal Logit Model (OLM) is pre-

sented. While Section 5 presents the interpretations of the empirical findings, Section 6 concludes the paper.

2. BACKGROUND AND HYPOTHESES

It is known that ventures are not started by chance, and that the venturing activity is created as a form of planned behavior (Ajzen, 1991). However, many new ventures do not realize substantial growth, because the entrepreneurs do not intent their ventures to achieve substantial growth (Kolvereid, 1992). Therefore, uncovering why some entrepreneurs have greater propensity for growth aspiration and intend to be a large venture, will provide valuable insight into why some intend to grow large while others do not.

Ajzen's (1991) Theory of Planned Behavior postulates three conceptually independent determinants to intention. The first is the attitude toward the behavior (growth); it refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the growth. The second predictor is a social factor termed subjective norm; it refers to the degree to which others consider growth to be important. The third one is the perceived behavioral control which refers to whether the individual believes (s)he is able to achieve firm growth. Together they determine an individual's intention to pursue firm growth. Our aim is to find out the determinants of growth ambition which are important drivers of firm growth.

To identify the determinants that might influence the growth expectations of early-stage entrepreneurs in Turkey, we used the model established by Verheul and van Mil (2008) and Terjesen & Szerb (2008). These two studies have used GEM data to examine growth

FIGURE -1: Determinants of growth expectations
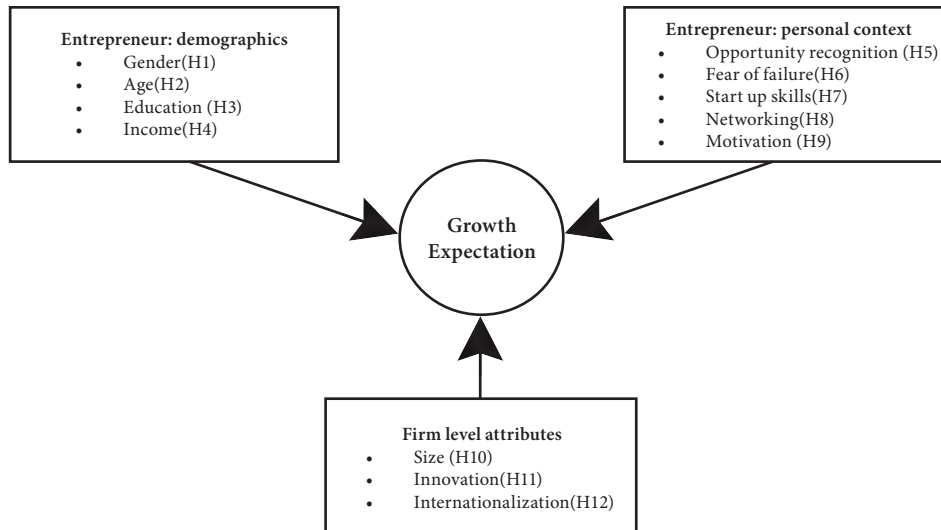
expectations. Verheul and van Mil investigated the determinants of the growth ambition and growth expectations among Dutch early-stage entrepreneurs. Terjesen & Szerb examined entrepreneurs, firms and national environmental factors associated with the growth expectations in 35 countries.

The present study investigates three factors: individual entrepreneur's demographics and personal context and firm level attribute (See Figure 1).

Gender

Many authors analyzed the influence of gender in determining the growth of the firm and indicated that gender affects business performance. Cooper et al.(1994) found that female businesses tend to be smaller and are less likely to grow compared to male-owned businesses. Moreover, females are more likely to have lower intended firm revenues than males (Cassar, 2006). Likewise, Autio (2005) finds that male early-stage entrepreneurs have higher growth expectations than women entrepreneurs. Furthermore, female entrepreneurs have less ambition to grow their firms than men (Bager and Schøtt, 2004) and being female has the most important negative effect on business growth (Terjesen and Szerb, 2008). However, Verheul and van Mil (2008) found that gender differences disappear after including control variables. Kolvereid (1992) found that there was no gender differences with respect to growth ambition; it may be due to the gender equality in Norway. Generally, being male is expected to have a positive effect on firm growth. Thus, we suggest;

Hypothesis 1: *Male early-stage entrepreneurs are more likely to have greater growth expectations than female early-stage entrepreneurs.*

Age

The results are mixed with regard to the age of the entrepreneur. For example, Cressy (1996) claimed a positive relationship between age of the entrepreneur and growth of the firm. On the other hand, some other studies found that the age of the entrepreneur had a negative effect on the growth ambition about the firm or expected firm's size (Bager and Schøtt, 2004; Autio, 2005; Terjesen and Szerb, 2008). Wiklund et al. (2003), and Cassar (2006) found no evidence of relationship between the age and the growth ambition. A study by Burns (2001) showed that middle aged entrepreneurs are more likely to grow their businesses compared to other age groups. Despite these mixed results, we will expect younger entrepreneurs to be more likely to have growth expectations than older entrepreneurs. Older entrepreneurs are less innovative, more interested in their status quo and less risk averse (Terjesen and Szerb, 2008) Thus we suggest;

Hypothesis 2: *Younger early-stage entrepreneurs are more likely to have greater growth expectations than older early-stage entrepreneurs.*

Education

Generally, education seems to provide the knowledge base and to improve analytical and problem-solving skills (Aidis et al.,2004), and especially, entrepreneurship education can increase awareness, confidence and enthusiasm (van Gelderen, et al.,2008). The education level of the entrepreneur has a positive influence on both firm survival and growth (Cooper et al, 1994). Brüderl and Preisendörfer (2000) explicitly indicated that firms owned by the entrepreneurs with more educational background were more likely to experience fast growth. Further, Shane and Venkataraman (2000) claimed that better educated people were expected to found firms with higher growth expectancies. The studies by Kolvereid (1992), Autio (2005, 2007), Terjesen and Szerb (2008) showed that there was a positive effect of education level of the entrepreneurs on the ambition of growth and expectation of growth. Although Cassar (2006) claimed that higher levels of human capital led to higher opportunity costs which drove up the desired and expected firm size, he could not find evidence to support his claim. Therefore, we expect a positive relationship between an entrepreneur's education level and his/her expectations for firm growth. Thus, we suggest;

Hypothesis 3: *Highly educated early-stage entrepreneurs are more likely to have greater growth expectations than early-stage entrepreneurs with lower level of education.*

Household Income

Individuals with greater wealth will intend to achieve something that is large enough to make a difference to their wealth (Bhide, 2000). Also, greater wealth provides greater financial resources which allow entrepreneurs to undertake larger size venturing before using outside sources of funding. Therefore, securing funding may be important in achieving the growth objectives. Cassar (2006) found that the opportunity cost of being a nascent entrepreneur measured by the household income had a positive influence on growth ambition. Autio (2005) found that high expectation entrepreneurial activity is overrepresented in high income groups. Individuals from high income families may be interested in more gainful opportunities than individuals from low income. Terjesen and Szerb (2008) claimed that individuals with higher incomes may finance their businesses better and access necessary resources for business growth. Therefore, we expect a positive relationship between an entrepreneur's household income and his/her expectations of firm growth. Thus, we suggest that;

Hypothesis 4: *Early-stage entrepreneurs with higher incomes are more likely to have greater growth expectations than early-stage entrepreneurs with lower incomes.*

Opportunity recognition

Opportunity recognition represents the most distinctive and fundamental entrepreneur-

ial behaviour according to many scholars (Eckhardt and Shane, 2003; Shane and Venkataraman, 2000). These claims confirm the entrepreneurship definition of Kirzner (1979) which defines entrepreneurs as individuals who are more likely than others to be alert to identification and to exploitation of profit opportunities.

The recognition of business opportunities will affect an entrepreneur's expectation to grow the firm. Autio (2005) finds that high-expectation early-stage entrepreneurs are significantly more likely to perceive good business opportunities than are low-expectation entrepreneurs. Terjesen and Szerb (2008) find that the ability to see good opportunities is positively and significantly related to business growth. However, Bager and Schøtt (2004) find a positive effect for nascent entrepreneurs only. Verheul and van Mil (2008) do not find any effect of opportunity perception on an entrepreneur's ambition to grow the firm. However, we still expect that entrepreneurs who perceive good opportunities in the environment to be more likely to have higher expectation of firm growth. Thus, we suggest that;

Hypothesis 5: *Entrepreneurs who perceive business opportunities are more likely to have greater growth expectations than those who do not perceive business opportunities.*

Fear of failure

Fear of failure affects the growth expectation of entrepreneurs. "Because growing the firm is associated with high risk, it may be expected that relatively risk averse entrepreneurs are less likely to have the ambition to develop the firm to its full potential" (Verheul and van Mil, 2008). However, they find that fear of failure has a weak effect only for nascent entrepreneurs. On the other hand, Cassar (2007) finds that individuals who are risk averse are more likely to have an ambition to grow the firm. According to Autio (2005) and Bager and Schøtt (2004), high-expectation nascent entrepreneurs are less likely to be constrained by the fear of failure. Thus, we suggest that;

Hypothesis 6: *Entrepreneurs who have lower levels of fear of the failure of their businesses are more likely to have greater growth expectations than entrepreneurs with higher levels of fear of failure.*

Entrepreneurial skills and knowledge

Entrepreneurs who believe in their entrepreneurial skills and knowledge are more likely to have a growth ambition, because they are more likely to feel confident with their skills and knowledge that they need to prove themselves by growing the businesses (Verheul and van Mil, 2008). However, they do not find that entrepreneurial skills have a significant effect on growth ambition. According to Autio (2005), Bager and Schøtt (2004) high-expectation nascent entrepreneurs and young business owners have more confidence in their entrepreneurial skills than low-expectation entrepreneurs. Terjesen and Szerb

(2008) find evidence for such a relationship for young and established business owners. Thus, we suggest that;

Hypothesis 7: *Early-stage entrepreneurs who believe in their entrepreneurial skills and knowledge are more likely to have greater growth expectations than early-stage entrepreneurs with low confidence in this area.*

Knowing other entrepreneurs (Networking)

Formal and informal networks (Aldrich and Martinez, 2001) and importance of role models (Wagner and Sternberg. 2004; Walstad and Kourilsky, 1998) are significant factors for entrepreneurial decisions. Networks are rich sources to get information about the opportunities that the entrepreneurs pursue (Light and Robenstein, 1995). Therefore, personal context is strongly linked to business growth (Terjesen and Szerb, 2008). Thus, we suggest that;

Hypothesis 8: *Early-stage entrepreneurs who are personally acquainted with entrepreneurs are more likely to have greater growth expectations than early-stage entrepreneurs with less embedded in entrepreneurial society.*

Motivation

A number of studies relate motives to aspirations. Individuals may have pull motives such as autonomy (i.e independence and freedom), income and wealth, challenge, and recognition and status to be entrepreneurs. Pull motives are also referred to opportunity motives. However, individuals may also be pushed into entrepreneurship (Thurik, et al., 2008). Push motives (also referred to as necessity motives) are present for example when (a threat of) unemployment forces people into self-employment.

Kolvereid (1992) found that the achievement motive was positively related to growth ambition. Davidsson (1989) explained that expectations of financial reward and of increased independence and concern for employee well-being were positively related to ambition to grow. Wiklund, Davidsson, and Delmar (2003) also showed that concern for employee well-being was the strongest predictor for growth ambition in Sweden. Generally, people starting up a business with the necessity motive have lower aspiration levels than opportunity motivated entrepreneurs (Reynolds et al., 2002). Those people are more likely to have a limited access to human capital, financial capital, technology, and other resources (Hessels et al., 2008). Therefore, their potential for generating job growth is likely to be constrained. According to Autio (2005) high-expectation entrepreneurs are found to be motivated by a business opportunity more often than low-expectation entrepreneurs. Studies by Terjesen and Szerb (2007) and Verheul and van Mil (2008) found that opportunity motivated entrepreneurs were more likely to focus on growth than necessity motivated entrepreneurs. Therefore, we expect that opportunity motive is a determinant

of entrepreneurial aspirations. Thus, we suggest that;

Hypothesis 9: *Opportunity motivated early-stage entrepreneurs are more likely to have greater growth expectations than necessity driven early-stage entrepreneurs.*

Firm size

Firm size, in terms of the number of employees, is taken into account only for the young business owners since it is not available for nascent entrepreneurs. With regard to firm size on growth ambition, the results are mixed. Davidsson (1989), Wiklund et al. (2003) argued that owners of small firms were more likely to pursue growth than owners of large firms. Other studies by Terjesen and Szerb (2008), Verheul and van Mil (2008) found evidence of a positive effect of firm size on growth ambition. We expect that the greater the firm size, the greater the firm growth expectations. Thus, we suggest that;

Hypothesis 10: *The greater the size of the firm, the greater the firm growth expectations.*

Innovation

According to Schumpeter, an entrepreneur is an innovator and (s)he is a key figure in driving economic development. Innovation is assumed to enhance the competitive advantage of the firm and create a sound ground for expansion. Terjesen and Szerb (2008) found that innovation was positively related to growth ambition. Verheul and van Mil (2008) also showed that the innovation was important for explaining expected growth by nascent entrepreneurs. Brüderl and Preisendörfer (2000) claimed that fast-growing firms were more likely to have introduced new products. This is supported also by the study conducted from Wynarczyk et al. (1993). Thus, we suggest that;

Hypothesis 11: *The more innovative the firm, the greater the firm growth expectations.*

Exporting

Empirical evidence indicates that the firms that are involved in exporting activities are more likely to be growing. International markets may speed up the growth process because they offer new business opportunities (Verheul and van Mil, 2008). Studies by Kolvereid (1992), Terjesen and Szerb (2008) and Verheul and van Mil (2008) found evidence that export activity was significantly related to growth ambition and expected growth. Thus, we suggest that;

Hypothesis 12: *The more export-oriented the firm, the greater the firm growth expectations.*

3. DATA AND DEFINITIONS OF VARIABLES

The data used in this paper were collected by means of the national adult population survey (APS) from the Global Entrepreneurship monitor (GEM) project (Reynolds et al., 2005) conducted in Turkey covering years 2006-2008. The combined dataset consisting of over 6,000 interviews with a representative sample of adults (18-64 years old) was hoped to increase the reliability of the empirical results. Using population surveys in these years, the prevalence rate of entrepreneurial activity (nascent and new firms) was estimated. Random Sampling Method was used and CATI (Computer Assisted Telephone Interview) was conducted by the vendor company[1].

Dependent Variable:

Growth expectations of early-stage entrepreneurs (GEESE): Early-stage entrepreneurs (TEA) represent the share of all adults (18-64 years old) who are actively involved in either starting or managing a business they will wholly or partly own, which is less than three and a half years old. GEM's data on growth expectations of early-stage entrepreneurs in terms of number of jobs to be created within the next five years has four categories: (1) no new jobs except that of the founder; (2) 1-5 more jobs (3) 6-19 more jobs (4) 20 or more jobs.

Independent variables:

1. Gender (GENDER): Respondents were asked to provide their gender:(1=male, 2=female).
2. Age (AGE): Respondents were asked to provide their age :(between 18 and 64).
3. Education (EDUCATION): Respondents were asked to provide the highest degree they had earned :(1=Illiterate, 2=literate, 3=Primary or secondary school, 4=High school, 5=Graduate and 6=Post graduate).
4. Household income (INCOME): Respondents were asked to provide information about their levels of household income: (1=Lower 33 %, 2=Middle 33 %, 3=Upper 33 %).
5. Opportunity perception (OPPORTUNITY): Respondents were asked if they believed that, in the 6 months following the survey, good business opportunities would exist in the area where they lived : (0=NO, 1=YES).
6. Fear of Failure (FEAR of FAILURE): Respondents were asked whether the fear of failure would prevent them from starting a business: (0=NO, 1=YES).
7. Self Confidence (SKILLS): Respondents were asked whether they believed to have the knowledge, skill, and experience required to start a business: (0=NO, 1=YES).
8. Knowing entrepreneurs (NETWORKING): Respondents were asked whether they knew someone personally who had started a business in the 24 months preceding the survey: (0=NO, 1=YES).

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[1] The vendor company is Akademetre which is a member of European Society of Opinion, Marketing Researchers (ESOMAR), and the Turkish Association of Marketing, and Opinion Researchers. It is an honour agreement with Association of Researchers possesses ISO 9000-2001 quality certification.

9. Motivation (MOTIVATION): Respondents were asked what drove them to become an entrepreneur: (0=opportunity motive, 1=necessity motive)
10. Size of the firm (SIZE): Respondents were asked how many people were employed in their businesses: (1= no jobs except that of the founder, 2=1-5 jobs, 3=6-19 jobs, and 4=20 or more jobs).
11. Innovation (INNOVATION): Respondents were asked about the newness of their products and services they offer to customers: (1=all customers, 2=some customers, 3=none of the customers).
12. Degree of exporting (INTERNATIONALIZATION): Respondents were asked what percentage of the expected sales were exported to foreign customers: (1=76-100%, 2= 26-75%, 3=1-25 %, and 4=None).

4. MODELING AND ESTIMATION OF ORDERED DATA BY ORDINAL LOGISTIC MODEL (OLM)

4.1. Modeling ordered data

Most of the time, the data obtained from surveys like GEM are ordered with more than two categories. In such cases, the respondents are asked questions according to some scale of a multiple category (polychotomous rather than dichotomous) outcome which is not nominal but ordinal. For example in our case, the expected number of jobs to be created by total early-stage entrepreneurship activity (TEA) within the next five years may be expressed in terms of four categories : no jobs except that of the founder, 1-5 jobs, 6-19 jobs and 20 or more jobs. It is well known that the Multinomial Logistic Model (MLM), or frequently called as the baseline logit model would not consider the ordinal nature of the outcome and hence the estimated odds ratios may not interpret the analysis properly (Hosmer and Lemeshow (2000)). Nor would the Linear Probability Model (LPM) be appropriate, because the predictions using the ordinary least squares would not look like true probabilities due to the difficulty, among others, of constraining them to the 0-1 interval. In this paper, we use the Ordinal Logistic Model (OLM) which takes into account the rank ordering of the outcome in terms of cumulative logits while preserving the proportional odds (PO) assumption. This amounts to asserting that the effect of each independent variable is identical for all relative cumulative probabilities.[2] To the best of our knowledge, any version of OLM has not been used so far in estimating GEM data. However, Zwan, Thurik and Grilo (2007) used OLM to interpret the results of the Flash Eurobarometer Survey on Entrepreneurship.

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[2] Ordinal Logistic Models (OLM) can be examined with the aid of proportional odds (POM), partial proportional odds (PPOM) and generalized unconstrained proportional odds (GOLOGIT) models perspectives. The non-proportional odds versions (PPOM and GOLOGIT) which consider the possibility of unequal coefficients imply that the cumulative probability curves for different categories of the dependent variable increase or fall at different rates. However, then these curves cross at certain independent variable values, leading to violate the basic underlying probabilistic fact that the cumulative probabilities have the proper order (Agresti 2007). Consequently, in this paper, the POM which is a constrained version of GOLOGIT is favored as an OLM.

Therefore, a natural order may exist for some polychotomous dependent variables. Unlike the multinomial model, the ordered version takes into account the categories having a natural ranking which may in turn be interpreted as showing the magnitude of some underlying continuous latent (unobserved) index. For example in our case, the expected number of jobs to be created by TEA entrepreneurs within the next five years expressed in terms of four categories (no jobs except that of the founder, 1-5 jobs, 6-19 jobs and 20 or more jobs) could then be viewed as resulting from a continuous latent measure called the growth aspirations of entrepreneurs. The OLM specifies the growth aspirations of entrepreneurs to be a linear function of the characteristics of the respondents in the survey, and an error term.

Each expected number of jobs to be created by the TEA entrepreneurs within the next five years corresponds to a particular range of growth aspirations index, whose limits are determined by some threshold (intercept) values with higher expected number of jobs corresponding to a higher range of growth aspirations of entrepreneurs. Consider for example the case of an entrepreneur whose current expected number of jobs falls in the first category. If his/her growth aspirations index were to increase, it would eventually exceed the value of the expected number of jobs to be created within the next five years that determines the boundary between the first and the second category, and the entrepreneur would therefore choose the second category (Becker and Kennedy ,1992).

4.2. Estimation of ordinal logistic model (OLM)

A motivation for the proportional odds structure of OLM has therefore reference to a model with an underlying continuous latent regression

$$y_i^* = \alpha + \Sigma\beta_k x_k + \varepsilon_i \tag{1}$$

where y_i^* is the unobservable growth aspiration index of a given entrepreneur in our case, $i=1,2,...N$, α is the constant term, ε_i is an error term whose distribution is assumed to be logistic (rather than normal (probit) or extreme value), and the summation is over $k=1,2,...K$ independent variables or covariates x_k's with coefficients β_k's in a sample of size N. The entrepreneurs have their own intensity of feelings of growth aspiration depending on such measurable factors, x_k's, and a certain error term, ε_i, describing some additional factors showing their encouragement or discouragement to affect the aspiration index.

The actual or observable polychotomous responses of the entrepreneurs y_i's, represent their unobservable continuous growth aspirations y_i^*'s, which fall within some threshold values λ_j's, $j=1,2,3$ in our case where the growth aspirations of the entrepreneurs have 4 categories, which must be estimated along with α and the β_k's using the Maximum Likelihood (ML) estimation method which is based on the notion that a sample of values we observe is more likely to come from a particular population than from others. Instead of observing y_i^*'s, we observe

$$y_i = 1 \qquad \text{if} \qquad y_i^* \le \lambda_1$$

$$y_i = 2 \qquad \text{if} \qquad \lambda_1 < y_i^* \le \lambda_2$$

$$y_i = 3 \qquad \text{if} \qquad \lambda_2 < y_i^* \le \lambda_3$$

$$y_i = 4 \qquad \text{if} \qquad \lambda_3 < y_i^* \qquad\qquad (2)$$

It is worth noting that the actual values chosen to represent the categories in y_i are completely arbitrary. All the ordered specification requires for ranking to be preserved is that higher values of y's to be associated with higher values of y's. The following probabilities can be obtained with a cumulative probability function, $F(.)$ depending on the probit, logit or extreme value models.

$$\text{Prob} \, (\, y_i = 1 \,) = \text{Prob} \, (\, y_1^* = \alpha + \Sigma\beta_k x_k + \varepsilon_i \le \lambda_1) = \text{Prob} \, (\, \varepsilon_i \le \lambda_1 - \alpha - \Sigma\beta_k x_k)$$

$$= F \, (\lambda_1 - \alpha - \Sigma\beta_k x_k)$$

$$\text{Prob} \, (\, y_i = 2 \,) = \text{Prob} \, (\, \lambda_1 - \alpha - \Sigma\beta_k x_k \le \varepsilon_i \le \lambda_2 - \alpha - \Sigma\beta_k x_k)$$

$$= F \, (\, \lambda_2 - \alpha - \Sigma\beta_k x_k) - F \, (\, \lambda_1 - \alpha - \Sigma\beta_k x_k)$$

and similarly for the other two remaining probabilities

$$\text{Prob} \, (\, y_i = 3 \,) = F \, (\, \lambda_3 - \alpha - \Sigma\beta_k x_k) - F \, (\, \lambda_2 - \alpha - \Sigma\beta_k x_k)$$

$$\text{Prob} \, (\, y_i = 4 \,) = 1 - F \, (\, \lambda_3 - \alpha - \Sigma\beta_k x_k) \qquad\qquad (3)$$

The logarithm of the Maximum Likelihood (ML) function is the log of the product of such expressions when the characteristics of the entrepreneurs, x_k's of a given sample are substituted.

$$l \, (\, \beta, \lambda \,) = \sum_{i=1}^{N} \sum_{m=1}^{4} \log \, (\, \text{Prob}(\, y_i = m \mid x, \beta, \lambda)) \, 1(\, y_i = m \,) \qquad\qquad (4)$$

where N is the sample size, m is number of possible categories of the dependent variable and $1(.)$ is an indicator function which takes the value 1 if the argument is true, and 0 if the argument is false. It is maximized with respect to both β and λ giving their maximum likelihood estimates. If $\alpha \ne 0$ including the intercept in equation (1) above, *the identification* is obtained by setting λ_1 equal to zero. The specification of zero mean and unit variance of the error terms is also done for exactly the same purpose (Becker and Kennedy, 1992). If there are only two choices for the dependent variable, the polychotomous ordered models reduce to the binary dependent variable models. In that case, there is a single threshold value which is equal to zero if a constant term is included in the regression, and is estimated to be equal to $- \alpha$ if it is not included.

5. ECONOMETRIC ESTIMATION RESULTS BY ORDINAL LOGISTIC MODEL (OLM)

5.1. Estimation of coefficients and model selection

In Tables 1-3 below, the dependent variable is the growth expectations of total early-stage entrepreneurship activity (TEA) of firm owners in terms of their expected number of jobs to be created within the next five years in four categories : *no new jobs except that of the founder (y = 1), 1-5 jobs (y = 2), 6-19 jobs (y = 3) and 20 or more jobs (y = 4)*. To be able to determine the important variables which explain this dependent variable, three consecutive *ordinal logistic regressions* (OLM) were run with respect to three sub-groups of independent variables:

Table 1: entrepreneur's demographic characteristics,
Table 2: entrepreneur's perceptual characteristics,
Table 3: firm's characteristics.

Table 1: *entrepreneur's demographic characteristics*

MODEL 1 : Dependent variable : Growth expectations of entrepreneurs, Independent variables (entrepreneur's demographic characteristics) : Gender, Age, Education and Income				
Independent Variables (IV's)	Coefficient	Std. error	Wald	P value
Gender	-0.859***	0.256	11.258	0.0008
Age	0.009	0.011	0.590	0.4425
Education	0.554***	0.134	17.216	0.0000
Income	0.246*	0.146	2.839	0.0920

Akaike information criterion	2.614
Schwarz information criterion	2.705
Likelihood Ratio test statistic	34.722*** (x_4^2 with 4 df)
Likelihood Ratio Index(LRI)	0.046

(***), (**) and (*) indicate the statistical significance of coefficients at 1%, 5% and 10% levels respectively.

In Table 1 above, four independent variables (IV's) representing the entrepreneur's demographic characteristics: Gender, Age, Education and Income, were used. Whereas Gender and Education IV's were found to be significant at 1%, Income was significant at only 10% using the Wald statistic which is distributed as a chi-square with one degree of freedom, x_1^2. The likelihood ratio test statistic which is distributed as a chi-square x_4^2=34.722 with 4 degrees of freedom compared the restricted and unrestricted log likelihoods, and

rejected the null hypothesis that the slopes of all 4 regressors were zero at much less than 1%, indicating that these variables were not all redundant.

In Table 2 below, five independent variables (IV's) representing the entrepreneur's perceptual characteristics were used: Opportunity, Fear of failure, Skills, Networking and Motivation. While Motivation was found to be significant at 1%, Networking was significant at only 10% using the Wald statistic. The likelihood ratio test statistic which is distributed as a chi-square x_5^2=17.484 with 5 degrees of freedom rejected the null hypothesis that the slopes of all 5 regressors were zero at much less than 1%, indicating again that these variables were not all redundant.

Table 2: *entrepreneur's perceptual characteristics*

MODEL 2 : Dependent variable : Growth expectations of entrepreneurs, Independent variables (entrepreneur's perceptual characteristics): Opportunity, Fear of failure, Skills, Networking and Motivation				
Independent Variables (IV's)	Coefficient	Std. error	Wald	P value
Opportunity	0.305	0.313	0.949	0.3300
Fear of failure	-0.171	0.405	0.179	0.6722
Skills	0.710	0.450	2.059	0.1513
Networking	0.658*	0.337	3.806	0.0511
Motivation	-1.067***	0.328	10.560	0.0012

Akaike information criterion	2.650
Schwarz information criterion	2.816
Likelihood Ratio test statistic	17.484*** (x_5^2 with 5 df)
Likelihood Ratio Index(LRI)	0.046

(***), (**) and (*) indicate the statistical significance of coefficients at 1%, 5% and 10% levels respectively.

Three independent variables (IV's) representing the firm's characteristics: Size, Innovation and Internationalization are shown in Table-3 below. The only significant IV was found to be the Size (at 1%) using the Wald statistic. The likelihood ratio test statistic which is distributed as a chi-square x_3^2=120.788 with 3 degrees of freedom rejected the null hypothesis that the slopes of all these 4 regressors were zero at much less than 1%, indicating again that these variables did not have a lack of explanatory power taken together.

Table 3: *firm's characteristics*

MODEL 3 : Dependent variable : Growth expectations of entrepreneurs, Independent variables (firm's characteristics): Size, Industry, Innovation and Internationalization				
Independent Variables (IV's)	Coefficient	Std. error	Wald	P value
Size	1.733***	0.184	88.283	0.0000
Innovation	-0.102	0.161	0.403	0.5256
Internationaliza-tion	0.093	0.138	0.453	0.5009

Akaike information criterion	2.274
Schwarz information criterion	2.364
Likelihood Ratio test statistic	120.788*** (x_6^2 with 3 df)
Likelihood Ratio Index(LRI)	0.193

(***), (**) and (*) indicate the statistical significance of coefficients at 1%, 5% and 10% levels respectively.

The empirical research is usually an interactive process. This process may begin with a series of specification of the unknown underlying relationship to be estimated. Selecting a final specification usually involves several steps regarding the independent variables to be kept within a large set of covariates and the functional form connecting these variables. Inevitably, there is uncertainty regarding the appropriateness of these initial specifications. However, once these preliminary regressions are estimated, they provide invaluable insights in terms of their results of many specification tests and model selection criteria toward determining a final model.

In Table 4 below, our final model (Model-4) involving five independent variables (IV's) is shown : Gender, Education, Income, Motivation and Size.[3] Both the Akaike (AIC) and Schwarz (SIC) information criteria indicated that the Model-4 was much better that the 3 initial tentative models (Tables 1-3) investigating some subgroups of variables as a first step to help construct our final model. In particular, the value of AIC was obtained to be 2.132 in Table-4 compared to those of 2.614, 2.650 and 2.274 in Tables 1-3 respectively. Moreover, the value of SIC was calculated as 2.279 in Table-4 compared to its values of 2.705, 2.816 and 2.364 in Tables 1-3 respectively. Furthermore, both the Likelihood Ratio test statistic and Likelihood Ratio Index favored the Model-4 rather than any of the first

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[3] The arrival to the final Model shown in Table 4 involved especially a decision to be made between Networking and Motivation regressors as to which one to be kept in the final model. Recognizing the non-linearity of the Income, the Motivation rather than the Networking was decided to be included in the final model since the latter's test statistic was much lower (0.976 versus 0.189 respectively). Moreover, the correlation matrix between the dependent variable and all 13 regressors indicated that the simple correlation between Motivation and the dependent variable was -0.278 whereas that of Networking was only 0.02. Even though the Age variable was included as a polynomial of second degree in the regression, it was not found significant.

3 initial tentative models.

Table 4:

MODEL 4 : Dependent variable : Growth expectations of entrepreneurs, Independent variables: Gender, Education, Income, Motivation and Size					
Independent Variables (IV's)	Coefficient	Std. error	Wald	P value	Odds Ratio
Gender	-0.874***	0.322	7.366	0.0066	0.417
Education	0.295*	0.178	2.728	0.0986	1.343
Income	-2.634**	1.157	5.182	0.0228	1.259
Income^2	0.715**	0.285	6.324	0.0119	
Motivation	-0.787***	0.301	6.843	0.0089	0.455
Size	1.768***	0.201	77.449	0.0000	5.859

Threshold values	$\lambda_1 = -1.058,\ \lambda_2 = 1.230,\ \lambda_3 = 3.066$
Akaike information criterion	2.132
Schwarz information criterion	2.279
Likelihood ratio test statistic	141.758*** (x_6^2 with 6 df)
Likelihood Ratio Index(LRI)	0.255

(***), (**) and (*) indicate the statistical significance of coefficients at 1%, 5% and 10% levels respectively.

In Table 4 above, the estimated ordered logit coefficient, -0.874 of the first independent variable, gender and its standard error of 0.322 are calculated by using the asymptotic covariance matrix derived from the likelihood function in the equation (4) above, by employing the quadratic hill climbing numerical procedure. The odds ratio (OR) of 0.417 indicates that the estimated odds that a female entrepreneur's expected number of jobs to be created within the next five years are in the growing direction equals 0.417 times the estimated odds of a male entrepreneur. In other words, the females are less than half as likely to expect to create more jobs compared to males. With respect to the education variable, the entrepreneurs with a higher level of education are about 1.35 times more likely to expect to create more jobs compared to those with a lower level of education. Likewise, the likelihood of the high-income entrepreneurs to expect to employ more labor is about 1.26 times that of the low-income entrepreneurs.[4] Furthermore, the odds for higher expected number of jobs to be created for the entrepreneurs whose motivation for the establishment of their businesses are of necessity-type are only about 0.45 compared to those business owners of opportunity-driven. Finally, with respect to the size variable, the odds of expectations of bigger firms' owners regarding to further grow in terms of

[4] The odds ratio for the income variable is calculated at its average slope, since this variable enters the regression function in a nonlinear fashion.

creating more employment are much higher (5.86) compared to those of small-sized businesses' owners.

Of the demographic characteristics, gender and education have significant and positive effects on the growth expectations of entrepreneurs (Table 1). Therefore, we find a convincing support for Hypothesis 1 and Hypothesis 3; the growth expectations are higher among entrepreneurs who are male and more educated. With respect to household income, the growth expectations are estimated to display a U-shaped curve. While low household income levels constraining individuals' financial resources decrease the expectations to employ more labor, high household income levels enhance individuals' financial positions and increase their growth expectations. Therefore, Hypothesis 4 is supported only for high household income entrepreneurs. However, we do not find any significant effect of age on entrepreneur's growth expectations and Hypothesis 2 is not maintained.

With respect to perceptual attributes of entrepreneurs, motivation is found to be a significant factor to influence their growth expectations positively (Table 2). Consequently, Hypothesis 9 is supported implying that entrepreneurs who had started their businesses because of opportunity motive are more likely to expect to expand their firms compared to those who had started because of necessity. Networking has a weak effect on the growth expectations of entrepreneurs. We find some weak support for Hypothesis 8. However, opportunity recognition, fear of failure, skills and knowledge variables are not found to play a role in explaining entrepreneurs' growth expectations. Therefore, we reject Hypotheses 5, 6 and 7.

Of the firm's characteristics, the size of the firm is found to be the only significant factor affecting growth expectations in a positive way (Table 3). The size variable included in the analysis tries to explain the growth ambitions of already young business owners, and not nascent entrepreneurs. The results show that young business owners with higher growth expectations are the ones possessing larger firms. Hence Hypothesis 10 is supported. The other two variables, innovation, and internationalization do not seem to have an impact on the growth expectations of early-stage entrepreneurs and we reject Hypotheses 11 and 12. Overall, we found that growth expectations are highest among entrepreneurs who are male, highly educated, having high household income, motivated by opportunity and already possessing large firms. Table-5 below reports a summary of acceptance or rejection of hypotheses.

Table 5:

ACCEPTANCE OR REJECTION OF HYPOTHESIS		
	ACCEPTED	**REJECTED**
GENDER	YES	-
AGE	-	YES
EDUCATION	YES	-
HOUSEHOLD INCOME	YES	-
OPPORTUNITY RECOGNITION	-	YES
FEAR OF FAILURE	-	YES
SKILLS AND KNOWLEDGE	-	YES
NETWORKING	-	YES
MOTIVATION	YES	-
FIRM SIZE	YES	-
INNOVATION	-	YES
EXPORTING	-	YES

5.2 Some scenarios to explain high expectations of Turkish early-stage entrepreneurs

In Table-4 above, the actual *size* of the firm was found to be the most important factor in influencing the high growth expectations of the entrepreneurs. The correlation matrix (not reported) showed that this variable was positively correlated with household *income* level and negatively correlated with *motivation*. Moreover, higher income level entrepreneurs were opportunity-driven rather than necessity-based, suggesting bigger actual sizes of firms to be associated with higher income leveled and opportunity recognizing entrepreneurs. Some scenarios that reflect the specific situations of some sub-samples (population cells) of entrepreneurs are described below. The estimated probabilities of growth expectations of early-stage entrepreneurs in the whole Turkish population are given in the first row of Table-6 as the case of a *typical entrepreneur*, and are repeated in Tables 7-10 for comparison purposes. These estimated probabilities are the tabulated counts of the categorical growth expectations of the entrepreneurs expressed in percentages in our sample of size 388. In the same Table, our first scenario examines the entrepreneurs who have achieved a sizeable amount of actual growth of their firms (size = 4) and have started their businesses seeing an opportunity to be exploited (motivation = 0) with high levels of household income (income = 3). In addition, the entrepreneurs are assumed to be female (gender = 2), and who have graduated from high school (education = 4). For this sub-group, the high expectations (y = 4)are about 68% (0.976-0.294) higher compared to a typical entrepreneur in the Turkish population.

Table 6:

Estimated probabilities of growth expectations of entrepreneurs : Scenario : Size (20 jobs firm), opportunity-based, high income, and females who have graduated from high school				
	Prob ($y = 1$)	Prob ($y = 2$)	Prob ($y = 3$)	Prob ($y = 4$)
TYPICAL ENTREPRENEUR	0.155	0.307	0.245	0.294
SCENARIO	0.000	0.000	0.024	0.976

In Table-7 below, the actual size of the firm is decreased down to 6-19 current employees for exactly the same types of entrepreneurs. Then, the high-expectations diminish from 98% down to about 58% having only about a 29% difference with a typical entrepreneur, showing the importance of the firm size variable.

Table 7:

Estimated probabilities of growth expectations of entrepreneurs: Scenario : Size (6-19 jobs firm), opportunity-based, high income, and females who have graduated from high school				
	Prob($y = 1$)	Prob($y = 2$)	Prob($y = 3$)	Prob($y = 4$)
TYPICAL ENTREPRENEUR	0.155	0.307	0.245	0.294
SCENARIO	0.000	0.020	0.396	0.584

With regard to gender and education, the data at hand (correlation matrix) showed that, even though higher income levels were associated with males rather than females, the education level was higher for females. Table-8 below shows how the high expectations of female entrepreneurs increase up to 69% if they have graduated from a University. However, in Table-9, about 79% of the male entrepreneurs holding only primary or secondary degree expect 20 or more jobs to be created. This percentage increases up to 86% in Table-10 if the male entrepreneur has obtained a high school degree, exceeding by about 28% (0.86-0.58) the high growth expectations of comparable female entrepreneurs given in Table-7 above.

Table 8:

Estimated probabilities of growth expectations of entrepreneurs: Scenario: Size (6-19 jobs firm), opportunity-based, high income, and females who have graduated from a University				
	Prob($y = 1$)	Prob($y = 2$)	Prob($y = 3$)	Prob($y = 4$)
TYPICAL ENTREPRENEUR	0.155	0.307	0.245	0.294
SCENARIO	0.000	0.010	0.296	0.694

Table 9:

Estimated probabilities of growth expectations of entrepreneurs: Scenario: Size (6-19 jobs firm), opportunity-based, high income, and males who have graduated from a primary or secondary school				
	Prob($y = 1$)	Prob($y = 2$)	Prob($y = 3$)	Prob($y = 4$)
TYPICAL ENTREPRENEUR	0.155	0.307	0.245	0.294
SCENARIO	0.000	0.004	0.210	0.786

Table 10:

Estimated probabilities of growth expectations of entrepreneurs: Scenario: Size (6-19 jobs firm), opportunity-based, high income, and males who have graduated from high school				
	Prob($y = 1$)	Prob($y = 2$)	Prob($y = 3$)	Prob($y = 4$)
TYPICAL ENTREPRENEUR	0.155	0.307	0.245	0.294
SCENARIO	0.000	0.002	0.137	0.861

Overall, the high growth expectations of firms in Turkey must be searched among the entrepreneurs who have already achieved sizeable amounts of actual growth of their firms with high levels of household income and who have started their businesses due to the recognition of an opportunity to be made profitable. In addition, the male entrepreneurs in Turkey with lesser amount of education seem to have higher growth expectations compared to their more educated female counterparts, ceteris paribus.

6. CONCLUSION

Given the increasing importance of entrepreneurship in job creation, innovation and economic growth, we tried to investigate the factors responsible for the high expectations of Turkish entrepreneurs in terms of the number of jobs they anticipate to create within the following five years. Since the dependent variable in this study was expressed in four ordered categories in terms of number of new jobs to be created within the following five years, the Ordinal Logistic Model (OLM) rather than a multinomial version, was used in estimating the unknown parameters of the significant factors. The data from the Global Entrepreneurship Monitor (GEM) for the years 2006-2008 for Turkey were consolidated into one dataset. Our findings indicated that the high growth expectations of early-stage entrepreneurs (TEA) in Turkey must first of all be searched among those who have already achieved a sizeable amount of growth of their firms with high levels of household income and who have started their businesses seeing an opportunity to be made profitable. In addition, the male entrepreneurs in Turkey with lesser amount of education seem to have higher growth expectations compared to their more educated female counterparts, ceteris paribus as shown in the scenarios.

For the policy implications, the following issues may be considered in order to encourage more growth expectations of Turkish entrepreneurs. Our results show that there is a significant and positive relationship between household income level and high-growth expectations in Turkey consistent with the findings of Autio (2005), Cassar (2006) and Terjesen and Szerb (2008). Since the lack of favorable sources of finance has been one of the biggest problems facing Turkish business owners, and founders of new firms depend largely on their own or their family's savings (Karadeniz and Ozdemir, 2009), the link between household income and high-growth expectations point out some interesting implications for policy makers. In Turkey, generally, the available debt capital is insufficient and access to debt capital is difficult for entrepreneurs. Furthermore, borrowing debt from banks is very costly. Seed capital funding and the venture capital markets are also insufficient. Hence, such types of capital funding should be prioritized, and a rapid development of financial support to encourage the entrepreneurs, especially the ones which have high growth expectations, seems to be needed. In addition, our results show that the greater the firm size, the greater the firm growth expectations and there is also positive correlation between firm size and income. In that respect, greater financial resources may allow entrepreneurs to undertake larger size venturing. Therefore, the availability of funding seems to be very important for policy considerations.

Moreover, as expected entrepreneurs who have opportunity motives possess higher growth expectations than the ones who have necessity motives. Indeed, necessity entrepreneurs do not have other options. Our results shows that the policy makers must be aware that entrepreneurs motivated to start a firm out of opportunity are likely to have high-growth expectations for their businesses and therefore are probably the ones to make a significant contribution to Turkey's employment creation and economic growth. Furthermore, our study exhibits that people with a higher level of education are more likely to expect high growth of their firms and there is a positive correlation between education and opportunity motives. Therefore, the likelihood of good opportunities arising for new business formation may depend on the ability and motivation of population to transform those opportunities into new ventures. Policy makers should concentrate their efforts on increasing entrepreneurial capacity within the population by recognizing the key role played by education in attempting to increase the perception of opportunity by widening individual horizons and opening new perspectives. Education should provide people with the requisite skills and capabilities around which a business can be built. Therefore, the education system in Turkey should focus more on creativity and communication skills which could improve the entrepreneurial skills. Entrepreneurship education should start at the primary level in order to motivate young people as early as possible. Because the world is becoming more competitive and the entrepreneurial education is becoming more critical, education system in Turkey must be more relevant to today's world and contribute adequately to Turkish economy's prosperity.

A further research may include the high-growth expectations of the established entrepreneurs, in addition to nascent and baby entrepreneurs. The factors that affect these types of expectations may very well differ for the business owners climbing up the entrepreneurial ladder.

APPENDIX: COMPUTER CODE WHICH CALCULATES THE PROBABILITY DISTRIBUTION OF THE DEPENDENT VARIABLE

An E-Views computer code which calculates the probability distribution of the dependent variable with respect to the dichotomous and polychotomous independent variables, and some scenarios can be made available from the authors. Other statistical softwares such as STATA and SAS can also be helpful.

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