

Entrepreneurial activity at the early stages in Central and Eastern European countries: Individual characteristics and the gender gap

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This study examines the factors influencing entrepreneurial activity at the early stages and the contribution of these factors to the gender gap in entrepreneurship in the seven Central and Eastern European countries. Using Global Entrepreneurship Monitor 2017 data, the author estimate logit models for three stages of the entrepreneurial process (potential entrepreneur, nascent entrepreneur, and early-stage entrepreneur) and apply Fairlie's decomposition method for calculating the contributions of variables in the gender gap. The study finds that individual demographic and entrepreneur-ship-related traits are influential determinants of the likelihood of being an entrepreneur at the early stages of business. Additionally, women are less likely to engage in all three stages of entrepreneurial activity in all countries. The decomposition analysis shows that the overall gender gaps range from 2.6 to 6.1 percentage points across the three stages of entrepreneurship. Gender disparities in explanatory variables explain 26.2 percent to 43.4 percent of these gaps. Factors such as start-up skills, higher household income, knowing other entrepreneurs, and employment significantly explain both entrepreneurial activity and the gender gap. Nevertheless, the extent of their effect is slightly different in the entrepreneurial phases.

Keywords:

entrepreneurship,
potential entrepreneur,
nascent entrepreneur,
early-stage entrepreneur,
gender gap,
global entrepreneurship monitor

Introduction

Entrepreneurship is crucial to the well-being and prosperity of society, and it is also one of the engines of economic growth and development. It encourages the innovation needed to not only capitalize on new opportunities, increase productivity, and generate jobs but also address some of society's most pressing issues. Following this concept, governments, international organizations, and other stakeholders have

implemented measures to promote entrepreneurship. The effectiveness of these measures differs depending on various issues, such as scope, resources, implementation methods, etc. However, public policy can be more effective by better understanding what factors motivate people to start businesses.

Much of the economic literature on entrepreneurship has concentrated on the motivations that cause individuals to become entrepreneurs. Previous scholars determined the likelihood of being an entrepreneur through demographic characteristics (Blanchflower 2004), subjective perceptions and beliefs about entrepreneurship (Arenius–Minniti 2005), and personality traits (Kerr et al. 2018). Another set of studies has shown that individual decisions concerning their employment may depend on aggregate conditions, including the level of technology, economic development, sociocultural environment, urban systems, and entrepreneurship system (Wennekers et al. 2002, Komlósi–Páger 2015, Aguilar 2022). Moreover, the empirical evidence shows that females' involvement in nascent entrepreneurial and total early-stage entrepreneurial (TEA) activities is lower than that of males. Therefore, to influence public policy, it is vital to identify the factors contributing to the gender gap. Most literature on entrepreneurial activity and gender disparities has been mainly explored in advanced countries.¹ It is unclear whether the characteristics and conditions encouraging entrepreneurial decisions in advanced economies can also be consistent with entrepreneurial activity in developing countries. Therefore, the literature is more interested in analyzing the factors influencing entrepreneurial decisions in countries other than advanced ones. This paper focuses on the seven Central and Eastern European (CEE) countries of Bulgaria, Croatia, Estonia, Latvia, Poland, Slovakia, and Slovenia because there is insufficient empirical evidence for these countries' contexts.

According to the World Bank's classification, the selected countries are high- and upper-middle-income countries, and all countries except Estonia are in the efficiency-driven development phase. Estonia is the only country in the innovation-driven development phase of these countries. Estonia and Latvia have a high ease of doing business ranking compared to other countries, which means the regulatory environment is favorable for the creation and operation of firms. The average TEA rates for the selected countries, 12.9% for males and 7.8% for females, are higher than the European averages of 9.5% and 6%, respectively (Elam et al. 2019). As shown in Table in the Appendix, the labor market situation for women is unfavorable in all selected countries, as evidenced by the ratio of the female to male labor force participation rate and the gender pay gap. The female/male labor force participation ratios vary from 73.7% (Poland) to 84.9% (Slovenia). As of 2019, females earned

¹ Bönnte–Piegeler 2013 (EU-27, USA, Japan, Switzerland, Norway, China, Turkey, and South Korea), Caliendo et al. 2015 (Germany); Clercq–Arenius, 2006 (Belgium and Finland), Setti 2017 (MENA), Minhtam–Leetrakun 2020 (ASEAN), Wagner 2007 (Germany).

approximately 15%² less than males in these countries, and the gender pay gap ranges from 7.9% (Slovenia) to 21.7% (Estonia). Additionally, the female unemployment rate is higher than that of men in Poland, Croatia, Slovenia, and Slovakia. However, the number of women working in informal jobs is less than that of men in every country.

This paper has two purposes. It primarily aims to investigate the determinants of CEE countries' entrepreneurial activity at the early stages using Global Entrepreneurship Monitor (GEM) 2017 data. Then, it estimates how much of the gender disparity can be caused by each factor. Entrepreneurial activity at the early stages ranges from individuals intending to start their businesses to early-stage entrepreneurs. In this aspect, this paper uses and compares three dependent variables to measure entrepreneurial activity at the early stages: potential entrepreneurs, nascent entrepreneurs, and early-stage entrepreneurs. The GEM project defines individuals who start businesses within the next three years as „potential entrepreneurs”. Nascent entrepreneurs are defined as those who are in the process of setting up a business but have not paid wages for longer than three months. Early-stage entrepreneurs are determined as those entrepreneurs who are either nascent entrepreneurs or owner-managers of a young firm between three and 42 months old (Bosma et al. 2017).

In terms of covariates, this research includes (i) individual demographic characteristics, (ii) individual entrepreneurship-related traits, and (iii) country dummies. Regarding the study's second objective, the relative contributions of variables to the gender gap are measured by the Fairlie decomposition technique. Assessing the contributions of determinants influencing gender gaps in entrepreneurial activities at various early stages is helpful, especially for policy-makers aiming to target entrepreneurship support programs in CEE countries.

The paper is organized as follows. The following section provides a conceptual framework and hypotheses regarding entrepreneurial activity. After that, the data and methodology used in the estimation are discussed. The next section describes the main findings, and the final section provides the conclusion.

Conceptual framework and hypothesis

Drivers of entrepreneurial activity

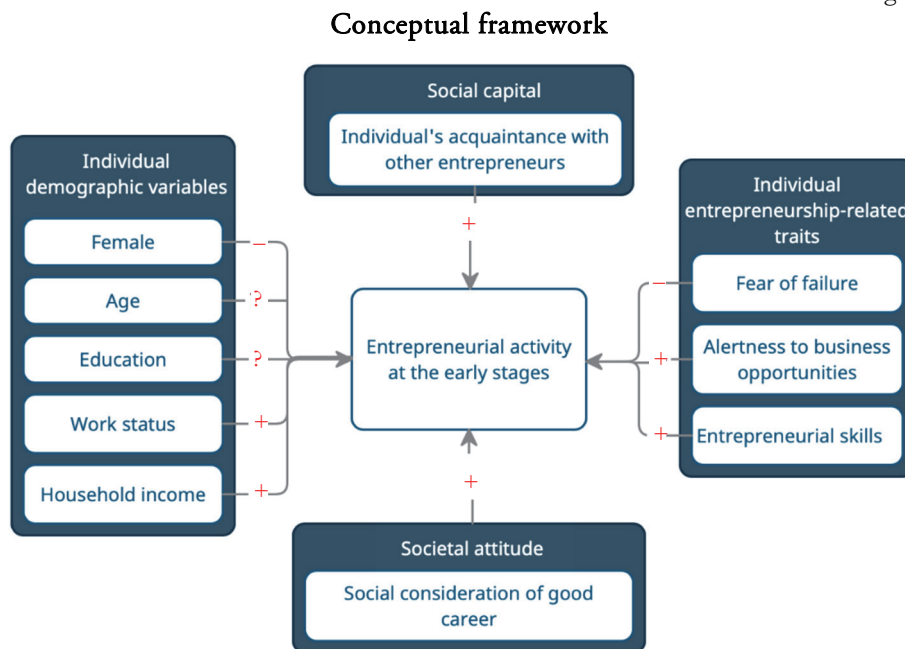
New venture creation is a complex activity. From a broad perspective, entrepreneurship research has been classified into four major categories: economic, psychological, sociological, and management approaches.³ Economic theories explain the aspects of economic rationality and assert that financial concerns are the primary reason for starting a new business. The psychological approach examines the impact

² Based on gross hourly earnings.

³ For a literature review of GEM studies, see Álvarez et al. (2014).

of an individual's personality traits on identifying entrepreneurial activity. The sociological approach mainly focuses on sociocultural environmental factors influencing the creation of a firm, while the management approach considers the resources and capabilities of the new firm. This paper combines psychological and sociological approaches to identify the determinants contributing to entrepreneurial activity. The paper combines individual demographic characteristics, entrepreneurship-related attributes, social capital, and attitude (Figure 1). In addition to these variables, the significance of the aggregate conditions on entrepreneurial activities is captured by introducing the country dummies.

Figure 1



Note: + refers to positive effect, – refers to negative effect, and ? refers to uncertain effect.
Source: Author's elaboration based on a review of the literature.

Individual demographic characteristics

Demographic variables include *gender*, *age*, *educational level*, *work status*, and *household income*. Compared to other regions⁴, women's entrepreneurial activity in Europe is low, leading to a significant gender gap. As of 2017, the lowest rate of women engaged in activities and the most considerable gender gap were registered in Europe (Elam et al. 2019). However, average women's participation rates in entrepreneurial activities in the selected CEE countries are slightly higher than the European average. Women's

⁴ North America, East/South Asia and the Pacific, Middle East and North Africa, Latin America and the Caribbean, and Sub-Saharan Africa.

entrepreneurial intentions and nascent activities are 3.1 and 2 percentage points higher than the European averages, respectively, and women's early-stage business is the same as the European average. On average, the gender disparity in these countries is 29% for entrepreneurial intentions, 31% for nascent activity, and 44% for early-stage businesses (Elam et al. 2019).

The vast majority of studies have discovered that females in entrepreneurial activities consistently underperform compared to males (De Vita et al. 2014, Langowitz–Minniti 2007, Simoes et al. 2016). Simoes et al. (2016) reviewed the explanations for this result, which are as follows: (i) women are more risk-averse than men; (ii) a small fraction of women pursue occupations in sectors with higher self-employment rates; (iii) women tend to have higher levels of satisfaction in their paid employment jobs; (iv) women are less likely to seek external financing and rely on their resources more significantly; and (v) women have disadvantages in social networks. Moreover, De Vita et al. (2014) pointed out that some transitional countries in CEE still have significant gender barriers for women who want to start their own business – making women entrepreneurs more vulnerable than men – due to a lack of access to trade, business networks, markets, and financial assistance.

Age is another commonly used explanatory variable. In regard to age as an explanatory factor for starting a business, the theoretical literature has emphasized numerous reasons supporting two fundamental ideas: (i) age has a positive impact, and (ii) there is a threshold at which the impact of this variable reverses. An inverse U-shaped link between age and entrepreneurship emerges from combining these aspects. Studies of entrepreneurial activity at the early stages found that an individual's propensity to start a business appears to be closely proportional to how young they are (Ramos-Rodríguez et al. 2012). In particular, young individuals would be more inclined to become entrepreneurs if an entrepreneurial activity is related to innovation, knowledge, and technical developments. According to the GEM data, the dominant age of individuals starting a business is very similar among the selected countries in the sample, ranging from 25 to 44 years. On average, 55% of individuals intending to start a business, 56% of nascent entrepreneurs, and 64% of early-stage entrepreneurs are in this range of ages for the countries. In turn, age has a detrimental influence on the propensity to start a business above a certain threshold due to several arguments, such as higher risk aversion levels and less time to recover the original investment made when starting self-employment. (Simoes et al. 2016). An inverted U-shaped relationship between age and entrepreneurial activity has been studied by several studies, such as Blanchflower (2004) and Caliendo et al. (2015). Following the literature, this paper tests the nonlinear impact of age in the econometric models, including age and squared age.

Educational level affects entrepreneurial activity, but its direction is ambiguous. Simoes et al. (2016) reviewed the relevant theoretical arguments in which individuals with higher educational levels may have more job prospects in the labor market.

Nevertheless, they are also better at finding self-employment opportunities and may have more vital managerial abilities. Empirical findings confirm the theoretical ambiguity, and evidence supporting a positive and a negative relationship between education and the propensity to become an entrepreneur was found in the literature. There is also evidence showing no significant relationship between these two variables. Simoes et al. (2016) reviewed some recent empirical research suggesting a viable option: a U-shaped association between education and starting a business. The key reason for this is related to the diverse motivations for self-employment. Those with less education are more likely to make this transition involuntarily, motivated by necessity, such as the fear of job loss or unemployment. In contrast, those with more education are more likely to be driven by opportunity. Furthermore, Van Der Sluis et al. (2008) observed that methodological issues, specifically different measures of educational attainment and the endogeneity of education in entrepreneurship entry, may contribute to this heterogeneous evidence. Following the literature, this study focuses on higher education's effect on entrepreneurial activity in its early stages.

Studies are practically unanimous in demonstrating the positive influence of prior experience on self-employment (Arenius–Minniti 2005, Poschke 2013, Simoes et al. 2016). Arenius–Minniti (2005) argue that employed individuals are more likely to establish their businesses than unemployed individuals. The experience and financial opportunities gained from employment can be the basis for starting their businesses. Lin et al. (2000) also concluded that those with past paid employment experience are 35% more likely to become entrepreneurs. As stated by Simoes et al. (2016), individuals may accumulate three different forms of experience throughout their careers, all of which help cultivate the ability to operate their own business: (i) managerial experience; (ii) industry-specific experience, including knowing business opportunities and having a more extensive network of suppliers and customers, etc.; and (iii) former self-employment experience. In contrast, Ramos-Rodríguez et al. (2012) mentioned that unemployment and poor working conditions could lead individuals to create their jobs under marginalization theory.

Financial resources are vital to starting and running a new business. In general, the evidence shows that individuals' decisions to establish a new business are positively related to household income since a high income level allows individuals to invest their wealth in various assets. Additionally, individuals with a more considerable household income tend to prefer to run their businesses rather than engage in employment (Arenius–Minniti 2005). Simoes et al. (2016) stated that an endogeneity problem in the typical examination of this topic was found in the literature.

Individual entrepreneurship-related traits

Researchers have been looking into whether certain traits predict whether an individual will become a business owner and whether a business owner will succeed. In this way, they examine which personality traits are more common in entrepreneurs

than in other groups and how they affect business survival and growth. The Big5 personality model has emerged as the dominant model in recent decades. Several attributes, such as the need for achievement, autonomy, self-efficacy, innovativeness, an internal locus of control, and risk attitudes, have been incorporated into the Big5 for entrepreneurial employment. Researchers often combine these characteristics to describe a „multidimensional entrepreneurial orientation” (Kerr et al. 2018). This research considers the individual attributes associated with entrepreneurial activity at the early stages, such as alertness to entrepreneurial opportunities, start-up skills, and fear of failure, due to the data availability of GEM data.

Individuals' subjective attentiveness to favorable prospects for beginning and running a business is linked to perceptions of promising entrepreneurial opportunities. According to Kirzner (1979), alertness to untapped entrepreneurial opportunities is a critical perceptual trait of entrepreneurial behavior and an essential precondition for entrepreneurial activity. Several empirical studies have proven that the ability to perceive good opportunities is an important driving force in involvement in entrepreneurial activities (Ramos-Rodríguez et al. 2012). The concept of self-efficacy is closely linked to start-up skills, defined in GEM as the perception of having the required skills and knowledge to start a business. Perceived self-efficacy is how well someone thinks they can do a task and obtain the desired results. Previous research has found a positive link between high levels of self-efficacy and individual entrepreneurial activities. For example, Clercq–Arenius (2006) reported that knowledge-based factors, especially start-up skills, strongly affect entrepreneurship. Therefore, the proposed hypotheses are as follows:

Hypothesis 1a: Individuals who perceive good business opportunities are more likely to be entrepreneurs across the selected CEE countries at the early stages.

Hypothesis 1b: Individuals with start-up skills are more likely to be entrepreneurs across the selected CEE countries at the early stages.

Fear of failure is a person's sense of how likely they will fail as entrepreneurs and what that means for them. This means that an individual's fear of failure and risk aversion are closely linked. Additionally, fear of failure is considered a measure of risk aversion (Maula et al. 2005). Starting a business requires a certain amount of risk, and one critical factor distinguishing entrepreneurs from employees is uncertainty and expected risks. Therefore, the greater an individual's risk aversion, the less confident one is in starting a business. Empirical studies have supported this assumption (Ramos-Rodríguez et al. 2012). The proposed hypothesis is as follows:

Hypothesis 1c: Across the selected CEE countries, individuals who have less fear of failure are more likely to be entrepreneurs at the early stages.

Social capital and attitude

Social capital is a broad concept that mainly refers to an individual's social networks, enabling them to derive benefits from these social structures, networks, and

affiliations through social trade. Various studies show that knowing other entrepreneurs positively affects entrepreneurial decisions. Ramos-Rodríguez et al. (2012) highlighted the role of three theories, planned behavior theory, role theory, and network theory, that influence starting a business by knowing other entrepreneurs. External knowledge provided by others in the entrepreneur's environment facilitates change in an individual's subjective norms by breaking down mental barriers (planned behavior theory), the discovery and exploitation of possibilities (role theory), and the identification, gathering, and allocation of scarce resources (network theory). Therefore, knowing other entrepreneurs may reduce individuals' ambiguity by increasing recognition of entrepreneurial opportunities and limitations in the market environment and providing access to an existing entrepreneur's social network (Aaboen et al. 2013, Abu Bakar et al. 2017). The above arguments are assumed to be consistent with the context of CEE countries, which leads to the hypothesis follow.

Hypothesis 1d. Across the selected CEE countries, individuals' acquaintances with other entrepreneurs positively affect entrepreneurial activities at the early stages.

Individual perceptions of social norms, values, beliefs, and assumptions socially carried by individuals within a society influence their behavior. In this aspect, individuals' willingness to start a business will affect their ideas of what their social environment deems appropriate. Namely, the attractiveness of an entrepreneurial career in society is a practical example of these factors. Moreover, Zhang–Schøtt (2017) found that job autonomy encourages people to become entrepreneurs, particularly men. They argued that in traditional cultures, job-autonomous and female employees are more likely to start their businesses than in modern ones.

Hypothesis 1e. Across the selected CEE countries, the idea that becoming an entrepreneur is a desirable career choice in society is positively associated with entrepreneurial activities at the early stages.

Country effects

Entrepreneurial activity can vary across countries, which may be due to economic, technological, spatial, cultural, and institutional factors. For instance, entrepreneurial activity rates are the highest in two of the seven countries, Estonia and Latvia. As of 2017, TEA rates were 19.4% and 14.2% in Estonia and Latvia, respectively, implying that one in every five adults is creating a new business or doing business less than 42 months old in Estonia. These countries have a sound regulatory environment to develop and operate a business. In contrast, entrepreneurial activity rates are the lowest in Bulgaria and Slovenia, where TEA rates were 3.7% and 6.9%, respectively. (Table 1). These results imply that there are sizeable distinctions in business creation across countries.

Consistent with the above rates, empirical studies show considerable differences in establishing a firm across countries and over time due to aggregate conditions such

as economic development, culture, institutions, and technology. Furthermore, the GEM National Expert Survey (NES) identifies various entrepreneurial framework conditions linked to government actions. National expert evaluations for 2018–2020 indicate that Latvia⁵ has the most supportive environment for entrepreneurship and Croatia the least supportive.⁶ Therefore, this paper attempts to measure an aggregate condition on entrepreneurial decisions by embedding country dummies.

Table 1

Variation in nascent entrepreneurship and TEA rates across CEE countries, 2017

Countries	Nascent entrepreneurship rate		Total early-stage entrepreneurial activity (TEA)	
	value ^{a)} , %	rank/54 ^{b)}	value ^{a)} , %	rank/54 ^{b)}
Poland	6.7	23	8.9	34
Slovakia	8.2	19	11.8	24
Slovenia	4.0	39	6.9	45
Croatia	6.1	28	8.9	34
Estonia	13.4	6	19.4	11
Latvia	9.4	15	14.2	16
Bulgaria	1.8	54	3.7	54

a) Proportion of population aged 18–64 years.

b) A total of 54 countries were included in GEM-2017.

Source: GEM 2017/2018 Global Report.

Gender gap decomposition

The second purpose of the research is to measure the contributions of the determinants to the gender disparity in entrepreneurial activity. Gender gaps in entrepreneurial decisions have become a more attractive topic. Several studies show that females in entrepreneurial activities are systematically below males even though the characteristics and conditions affecting male and female entrepreneurship tend to be similar (Langowitz–Minniti 2007, Koellinger et al. 2013). Most used a qualitative approach, but a few studies used decomposition techniques to estimate explicit gender disparity, such as Oaxaca–Blinder, Fairlie, and Yun. Although the Oaxaca–Blinder decomposition technique is commonly applied to identify and calculate the separate contributions of covariates to the group differences, it cannot be applied straightforwardly to the binary outcome and estimated coefficients of the logit and probit models. In this sense, this paper uses the nonlinear decomposition of binary outcome differentials provided by Fairlie (2005).

⁵ Estonia is not included in the NES of 2018–2020.

⁶ For further details, see (<https://www.gemconsortium.org/data/key-nes>).

Bönte–Piegeler (2013) examine the effect of gender differences in competitiveness related to the gender gap in latent and nascent entrepreneurship in 36 countries⁷ using the Fairlie (2005) decomposition technique. They found gender gaps of 7.71 percentage points for latent entrepreneurs (people who want to work for themselves) and 2.94 percentage points for nascent entrepreneurs (people making the first moves toward launching a new business). Covariates explain approximately 16% of the gender gap in latent entrepreneurs and 55% of the gender gap in nascent entrepreneurs, with competitiveness and risk preferences contributing more to the gap in latent and nascent entrepreneurship.

Bernat et al. (2017) also apply the Fairlie decomposition method to estimate the contribution of determinants leading to gender disparities under three different entrepreneurship scenarios (all entrepreneurs, stable entrepreneurs, and employer entrepreneurs) for Latin America. They found that the overall gender difference ranged between 4 and 13 percentage points. The employer-entrepreneur has a minor disparity, whereas the other two groups have a gap of more than 8 percentage points. Work satisfaction, parent business ownership, risk tolerance, and car ownership explain 23–38% of the overall gap. Studies using other decomposition methods suggest that risk tolerance, high school education, employment, risk aversion, and venture capital contribute more to the gender gap than other variables (Lins–Lutz 2016).

Following the literature above, I expect that gender differences in individual entrepreneurship-related traits, social capital, and societal attitudes contribute to the gender gap in entrepreneurial activity at the early stages in CEE countries. This leads to the hypotheses follow:

Hypothesis 2a. The gender gap in entrepreneurship at the early stages is related to gender differences in entrepreneurial-related traits.

Hypothesis 2b. The gender gap in entrepreneurship at the early stages is related to gender differences in social capital.

Hypothesis 2c. The gender gap in entrepreneurship at the early stages is related to gender differences in societal attitudes.

Data and methodology

Data and descriptive statistics

This paper uses the GEM Adult Population Survey (APS) of 2017, and 20,348 individuals from seven CEE countries are included in the sample. Poland accounts for 39.5% of the sample, and the other six countries account for 60.5% (an average of 10% each). The gender representation of the sample is relatively even, with 50.7% of women and 49.3% of men (Table 2).

⁷ Thirty-two European countries, China, Japan, South Korea, and the USA, were included.

Table 2

Sample size and types of entrepreneurial activity by gender, 2017

Country	Sample size			Potential entrepreneur			Nascent entrepreneur			Early-stage entrepreneur		
	total	female	male	total	female	ratio	total	female	ratio	total	female	ratio
				%	female/male	%	female/male	%	female/male			
Poland	8,043	4,033	4,010	9.3	6.1	0.49	6.7	6.1	0.83	8.9	7.7	0.78
Slovakia	2,000	993	1,007	13.8	11.9	0.76	8.2	6.6	0.68	11.8	9.8	0.71
Slovenia	2,005	1,021	984	12.0	8.8	0.57	3.1	1.9	0.42	5.4	3.2	0.42
Croatia	2,000	1,031	969	21.0	16.2	0.62	6.0	4.1	0.51	8.8	6.5	0.58
Estonia	2,300	1,174	1,126	15.3	11.5	0.60	11.2	8.5	0.61	16.4	11.8	0.55
Latvia	2,000	1,066	934	17.4	14.7	0.72	7.9	5.6	0.54	11.7	8.6	0.57
Bulgaria	2,000	990	1,010	4.9	3.6	0.60	1.8	1.6	0.86	3.7	3.0	0.70
Total	20,348	10,308	10,040	12.2	9.2	0.61	6.6	5.3	0.68	9.4	7.5	0.65

Source: GEM 2017 APS Global Individual-Level data.

A total of 2,480 (12.2% of the sample) individuals intending to start a business (referred to as potential entrepreneurs), 1,337 (6.6% of the sample) nascent entrepreneurs, and 1,918 (9.4% of the sample) early-stage entrepreneurs were determined across the seven countries in the sample. In all countries, the prevalence rates of women who are potential, nascent, and early-stage entrepreneurs are lower than those of men. The highest rates of women's entrepreneurial intention are found in Croatia (16.2%), and women involved in nascent and early-stage entrepreneurship are the most prevalent in Estonia (8.5% and 11.2%, respectively). In contrast, women's engagement in these three stages of entrepreneurship is the lowest in Bulgaria compared to the other countries. Among the seven countries, female/male ratios for three categories vary from 0.4 to 0.9; the largest gender gap is in Poland for potential entrepreneurs and in Slovenia for nascent and early-stage entrepreneurial activities.

The importance of generating correct inferences about populations is emphasized in a survey. Theoretically, simple random sampling is the optimum method for this goal, but it is frequently impracticable or prohibitively expensive. More practical but sometimes sophisticated sampling procedures are used to generate suitably representative samples in place of the ideal of simple random sampling, with postsampling changes made as appropriate. In this regard, the GEM APS data provide two types of weights, adjusting for sample design and selection bias. This paper uses the response weights to better represent the overall population in the survey sample. Weights are employed in this scenario to lessen the possibility of bias in the data gathered due to varied response rates or normal sample variability. The response weights are calculated based on gender and age in the GEM age groups (Bosma et al. 2017).

The Table 3 describes all the variables used in this study, sample size, and average values.

Table 3

List of variables

Name of variables	Type	Definition	Sample size	Sample average
Dependent variables				
Potential Entrepreneur	Dummy	1=entrepreneurial intention (intention among individuals to start a business within the next three years); 0=nonintentional entrepreneur	20,290	0.12
Nascent entrepreneur	Dummy	1=nascent entrepreneur (Actively involved in start-up effort, owner, but has not paid wages for longer than three months); 0=nonnascent entrepreneur	20,348	0.07
Early-stage entrepreneur (TEA)	Dummy	1=early-stage entrepreneur (Actively involved in the total early-stage entrepreneurial activity); 0=nonearly-stage entrepreneur	20,348	0.09
Independent variables				
<i>Demographic variables</i>				
Female	Dummy	Gender: 1=woman; 0=man	20,348	0.51
Age	Numerical	Age of respondents measured in years	19,211	43.97
Higher education	Dummy	1= graduate degree; 0=otherwise	20,348	0.09
Employed	Dummy	Work status: 1=employed (full-time work, part-time, self-employed); 0=not employed (retired, disabled, homemaker, not working)	20,046	0.72
Household (HH) income				
Lower 1/3	Dummy	1= lowest 33 percentile; 0=otherwise; used as a reference category	16,135	0.32
Middle 1/3	Dummy	1=middle 33 percentile; 0=otherwise	16,135	0.35
Upper 1/3	Dummy	1=upper 33 percentile; 0=otherwise	16,135	0.33
<i>Individual entrepreneurship-related traits</i>				
Opportunity	Dummy	Perceives good opportunities to start a business in your area: 1=Yes; 0=No	20,331	0.34
Start-up skills	Dummy	Perceives to have the required skills and knowledge to start a business: 1=Yes; 0=No	20,316	0.46
Fear of failure	Dummy	Fear of failure would prevent you from starting a business: 1=Yes; 0=No	20,296	0.42
<i>Social capital and attitude</i>				
Know entrepreneur	Dummy	Personally, knows someone who started a firm in the past two years: 1=Yes; 0=No	20,344	0.38
Promising career	Dummy	In my nation, most individuals regard starting a new business as a good professional path: 1=Yes; 0=No	20,323	0.58
<i>Country effect</i>				
Poland	Dummy	1=respondent in Poland; 0=otherwise	8,043	0.395
Estonia	Dummy	1=respondent in Estonia; 0=otherwise	2,300	0.113
Croatia	Dummy	1=respondent in Croatia; 0=otherwise	2,000	0.098
Latvia	Dummy	1=respondent in Latvia; 0=otherwise	2,000	0.098
Slovenia	Dummy	1=respondent in Slovenia; 0=otherwise	2,005	0.099
Slovakia	Dummy	1=respondent in Slovakia; 0=otherwise	2,000	0.098
Bulgaria	Dummy	1=respondent in Bulgaria; 0=otherwise; used as a reference country	2,000	0.098

Table A2 in the Appendix summarizes the descriptive statistics of the variables for entrepreneurial intentions, nascent entrepreneurship, and early-stage entrepreneurial activity. There are statistically significant differences between nascent and nonnascent entrepreneurs, intentional and nonintentional entrepreneurs, and early-stage and nonearly-stage entrepreneurs for all demographic and perceptual variables. Focusing on the differences between females and males, I found statistically significant differences in proportions for variables such as higher education, household income, start-up skills, knowing other entrepreneurs, and fear of failure for the three types of entrepreneurs. Therefore, possessing a graduate education, having a higher household income, having start-up skills, knowing other entrepreneurs, and having a fear of failure are the essential factors for differentiating female and male entrepreneurs in the early stage of business.

Methodology

Logit model for binary response. The binomial logistic regression model is employed to estimate the influential individual factors of entrepreneurial decisions. It calculates the probability of being an intentional/nascent/early-stage entrepreneur. Because of the nonlinear nature of the logit model, the maximum likelihood estimation method is applied to estimate the logit coefficients. However, when the prevalence rate of entrepreneurship is low (under 5% of the sample), it is suggested to use logistic regression in rare events (King–Zeng 2001). This paper uses logistic regression for rare events to estimate the model for nascent entrepreneurship since its prevalence rate is the lowest (6.6% of the sample) compared to entrepreneurial intentions and early-stage entrepreneurs. It calculates the same logit model with an estimator producing a lower mean square error in the presence of rare event data. To handle the missing values, this paper uses the multivariate imputation by chained equations (MICE) approach since it enables the specification of models for a wide range of variable types, including binary, ordinal, nominal, truncated, and count variables.

The odds ratios provide a more meaningful interpretation of the logit coefficients. „The odds ratio is widely used as a measure of association as it approximates how much more likely or unlikely (in terms of odds) it is for the outcome to be present among those subjects with $x = 1$ as compared to those subjects with $x = 0$ ” (Hosmer et al. 2013: p. 64). The goodness-of-fit of the models is assessed by the Pearson goodness-of-fit test and the percent correctly predicted.

Fairlie decomposition. In the second phase of the analysis, Fairlie decomposition is used to quantify the contributions of the determinants to the gender disparity in entrepreneurial activity at the early stages. The Oaxaca–Blinder decomposition technique is the most common and seminal decomposition method, introduced in 1973. It is used to determine and measure the contributions of group differences in independent variables to the outcome gap. However, this

decomposition technique requires the coefficients estimated from the linear regressions. In this respect, there are some extensions of the Oaxaca–Blinder decomposition technique to the case of the binary dependent variable. Fairlie (2005) proposed a method to carry out a decomposition by applying the coefficients estimated by a logit and probit model. Separate logit equations are computed for each group in this scenario:

$$Y_i = F_i(X_i, \beta_i), i = 1, 2$$

where Y_i is the predicted probability for group i , X_i is the independent variable, and F is the cumulative distribution function from the standard normal distribution or logistic distribution. Therefore, the decomposition for a nonlinear equation is:

$$\underbrace{Y_i(X_i, \hat{\beta}_i) - Y_j(X_j, \hat{\beta}_j)}_{\substack{\text{the difference in} \\ \text{the average predicted probabilities} \\ \text{between groups } i \text{ and } j}} = \underbrace{[F_i(X_i, \hat{\beta}_i) - F(X_j, \hat{\beta}_i)]}_{\substack{\text{the part of the differential} \\ \text{due to group differences in} \\ \text{the covariates}}} + \underbrace{[F(X_j, \hat{\beta}_i) - F_j(X_j, \hat{\beta}_j)]}_{\substack{\text{the part of the differential} \\ \text{due to group differences in} \\ \text{unobserved endowments}}}$$

Aside from producing an aggregate difference measure, Fairlie (2005) offered a method to assess the contribution of each explanatory variable in explaining the mean gap. One-to-one matching of cases between the two categories is used in the decomposition technique. If the sample sizes for each group are different, matching and subsample replacements are needed, and a sample is drawn from the larger group. Because the findings are dependent on the sample, the procedure is repeated, and the average results are presented – the decompositions in this paper use 1000 random subsamples of females to determine these means using STATA 15.0.

Results

Determinants of entrepreneurial activity at early stages

This section discusses the results of the logit regression models for the whole sample. Initially, 15,248 out of 20,348 individuals in the seven countries were included in the estimation sample due to a lack of responses to questions. In particular, 25% of the sample was missed, the majority due to nonresponses to questions about household income, age, and employment status. I use the MICE approach to handle the missing values since age is a numeric variable, income is a categorical variable, and work status is a binary variable. After using the MICE approach, the total sample size reached 20,209, and 0.7% of the sample was missing. Furthermore, a few outliers were identified and eliminated from the data since they conflicted with the pattern of the data and the model estimates. The model estimation results for each of the three entrepreneurs are shown in Table 4. The model diagnostic tests (the Pearson goodness-of-fit test and the percent correctly predicted) show that the three models fit reasonably well.

Table 4

Logit regression models for entrepreneurial activity at the early stages

Variables	Estimates			Odds Ratio		
	potential	nascent	early-stage	potential	nascent	early-stage
	entrepreneurs					
Female	-0.520*** (0.049)	-0.273*** (0.066)	-0.290*** (0.056)	0.595*** (0.029)	0.761*** (0.050)	0.748*** (0.042)
Age	0.031** (0.013)	0.050*** (0.023)	0.050*** (0.018)	1.032** (0.013)	1.051** (0.024)	1.051*** (0.019)
Age ²	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	0.999*** (0.000)	0.999*** (0.000)	0.999*** (0.000)
Higher education	0.158* (0.084)	-0.069 (0.111)	0.073 (0.092)	1.171* (0.099)	0.933 (0.104)	1.076 (0.099)
Employed	0.038 (0.069)	0.711*** (0.119)	0.979*** (0.107)	1.039 (0.071)	2.035*** (0.242)	2.662*** (0.286)
HH income: Middle 1/3	-0.185** (0.072)	-0.057 (0.101)	-0.103 (0.086)	0.831** (0.060)	0.944 (0.096)	0.902 (0.078)
HH income: Upper 1/3	0.181*** (0.070)	0.418*** (0.099)	0.392*** (0.086)	1.199*** (0.083)	1.519*** (0.151)	1.481*** (0.127)
Opportunity	0.220*** (0.054)	0.119* (0.071)	0.135** (0.060)	1.246*** (0.067)	1.127* (0.080)	1.145** (0.069)
Start-up skills	0.602*** (0.052)	0.583*** (0.070)	0.733*** (0.060)	1.826*** (0.095)	1.791*** (0.126)	2.081*** (0.124)
Fear failure	-0.134*** (0.051)	-0.309*** (0.069)	-0.324*** (0.059)	0.875*** (0.044)	0.735*** (0.050)	0.723*** (0.043)
Know entrepreneur	0.292*** (0.051)	0.463*** (0.067)	0.539*** (0.057)	1.339*** (0.068)	1.589*** (0.107)	1.714*** (0.098)
Promising career	0.106** (0.051)	0.020 (0.067)	0.054 (0.057)	1.112** (0.057)	1.020 (0.068)	1.056 (0.061)
Poland	0.680*** (0.121)	1.814*** (0.230)	1.115*** (0.145)	1.975*** (0.239)	6.135*** (1.413)	3.051*** (0.442)
Latvia	1.632*** (0.126)	2.178*** (0.236)	1.622*** (0.153)	5.116*** (0.644)	8.832*** (2.087)	5.065*** (0.774)
Estonia	1.355*** (0.132)	2.447*** (0.238)	1.856*** (0.154)	3.875*** (0.512)	11.559*** (2.754)	6.398*** (0.986)
Croatia	1.719*** (0.129)	1.796*** (0.248)	1.218*** (0.166)	5.577*** (0.717)	6.028*** (1.497)	3.379*** (0.560)
Slovenia	1.258*** (0.131)	1.162*** (0.259)	0.740*** (0.171)	3.520*** (0.463)	3.198*** (0.830)	2.095*** (0.359)
Slovakia	1.233*** (0.128)	2.175*** (0.234)	1.578*** (0.152)	3.430*** (0.440)	8.804*** (2.060)	4.844*** (0.737)
_cons	-3.154*** (0.263)	-5.958*** (0.474)	-5.275*** (0.367)	0.043*** (0.011)	0.003*** (0.001)	0.005*** (0.002)
Observations	20,040	20,096	20,096	20,040	20,096	20,096
F test	66.28***	44.00***	66.13***	66.28***	44.00***	66.13***
Percent correctly predicted	Overall	70.39	82.12	73.46	70.39	82.12
	Sensitivity	62.5	49.45	66.17	62.5	49.45
	Specificity	71.6	84.17	74.13	71.6	84.17
Pearson for goodness-of-fit test ^{a)} (sig.)	0.996	0.900	1.000	0.996	0.900	1.000

Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

a) The hypothesis of an adequate model fit is accepted if the p value is greater than 0.05.

Note: The reference country is Bulgaria.

It is noteworthy that there were no significant changes in the significance and magnitude of the estimated coefficients of the three models compared to the logit regression results using the 15,248 samples before applying the MICE technique and eliminating the outliers. However, the impacts of country dummies slightly increased for potential and nascent entrepreneurs, particularly in Latvia, Croatia, and Slovakia. The goodness-of-fit of the models is improved, especially the overall percent accurately predicted for potential entrepreneurs. As a result, the estimated models are robust after employing the MICE technique.

Among the demographic variables, the coefficients for female and age² are negative and statistically significant for all entrepreneur categories. The odds ratios for females are 0.595 for potential entrepreneurs, 0.761 for nascent entrepreneurs, and 0.748 for early-stage entrepreneurs. This implies that women's probabilities of being entrepreneurs are approximately 24–40% lower than men's. Especially for individuals intending to become entrepreneurs, women are less likely to start a business than men. This result is compatible with the findings of previous studies; for example, Bernat et al. (2017) estimate that women's odds of being an entrepreneur are approximately one-half of men's odds of being an entrepreneur. Additionally, Bönte–Piegeler (2013) find that females' likelihood of being latent and nascent entrepreneurs is 7.8 and 1.89 percentage points less than men's. The relationship between age and the three types of entrepreneurship can be illustrated as an inverted U-shape curve. The estimates of age and age² show that becoming an entrepreneur increases at an early age and reduces after that.

Higher education is only statistically significant for potential entrepreneurs. Namely, the coefficient of higher education is statistically significant and positively related to the likelihood of starting a business within three years. The odds ratio of higher education shows that those with a graduate degree are 1.171 times more likely to become entrepreneurs than those without a graduate degree. Although higher education is not statistically significant for the probability of being a nascent or early-stage entrepreneur, the coefficient is negative for nascent entrepreneurs and positive for early-stage entrepreneurs. These results could be explained by the fact that education and entrepreneurial activity have a U-shaped relationship.

Being employed is positively and significantly related to the probability of being a nascent or early-stage entrepreneur, although it is not statistically significant for the potential entrepreneur category. The odds ratio of being employed is higher for early-stage entrepreneurs than for nascent entrepreneurs. The odds of being an early-stage entrepreneur among employed individuals are 2.662 times greater than those among unemployed individuals. The evidence is consistent with previous findings that employed individuals are more likely to establish and run successful businesses than unemployed individuals (Arenius–Minniti 2005, Poschke 2013, Simoes et al. 2016).

The findings of household income⁸ indicate that the coefficient of middle income is negative and statistically significant for the potential entrepreneur category, while it

⁸ The lower income group is selected as a reference category.

is not statistically significant for the nascent and early-stage entrepreneur categories. The coefficients are positive and statistically significant for all entrepreneur categories for upper-income households. These results can be explained by the U-shaped relationship between household income and being an entrepreneur in the early stages. Starting a new business at a low-income level may allow individuals to access the higher expected yields or obtain a job. In this aspect, individuals in the lowest-income group are more likely to become entrepreneurs than those in the middle-income group. At high-income levels, household income increases the probability of starting a business by reducing financial barriers. The odds ratios for upper-income households show that those in the upper-income group are 1.199–1.519 times more likely to become entrepreneurs than those in the lower-income group.

Regarding individual entrepreneurship-related traits, opportunity and start-up skills are positive and statistically significant for all entrepreneur categories, confirming Hypotheses 1a and 1b. The odds ratios for the opportunity are similar for the three entrepreneur categories (1.127–1.246). The odds ratio for start-up skills is 1.826 for potential entrepreneurs, 1.791 for nascent entrepreneurs, and 2.081 for early-stage entrepreneurs, suggesting that start-up skills are the most influential factor. For example, the odds of being an early-stage entrepreneur are 2.081 times higher for those with start-up skills than for those without these skills. This evidence is matched with the strong effect of start-up skills on becoming an entrepreneur, as documented by other studies such as Clercq–Arenius (2006) and Ramos-Rodríguez et al. (2012). The remaining variable, fear of failure, is negatively and significantly related to the likelihood of becoming an entrepreneur, which is in line with Hypothesis 1c. Nascent and early-stage entrepreneurs' odds are lower than those of individuals with entrepreneurial intentions. One possible explanation is that nascent and early-stage entrepreneurs fear failure to some extent because they have already taken the first steps toward running a business compared to those who have not started a business.

For social capital and attitude, knowing other entrepreneurs has a positive and significant impact across all entrepreneur categories. In contrast, a promising career has a statistically significant effect only on the entrepreneur intention category. These results show that Hypothesis 1d is true for all types of entrepreneurs, and Hypothesis 1e is only true for individuals who intend to start a business in the next three years. The odds ratio of knowing other entrepreneurs for potential entrepreneurs (1.339) is lower compared to that of nascent (1.589) and early-stage (1.714) entrepreneurs. Therefore, nascent and early-stage entrepreneurs benefit more from social structure, networks, and affiliation.

Bulgaria was selected as the reference country because it has the lowest prevalence rates for all entrepreneur categories compared to other countries. All dummy variables corresponding to the countries are positive and statistically significant for the three entrepreneur categories. All six countries perform significantly better than Bulgaria, keeping all the variables constant. Croatia and Latvia have the highest odds for potential entrepreneurs, which implies that the likelihood of becoming an

entrepreneur in Croatia and Latvia is over five times higher than in Bulgaria. In contrast, Poland has the lowest odds (1.975) in the potential entrepreneurial category. The odds of being a nascent or early-stage entrepreneur in Estonia, Latvia, and Slovakia are significantly higher than in Bulgaria. One possible explanation for this finding is that these countries' business environments enable more conducive entrepreneurial activity. For example, Estonia and Latvia are ranked 18th and 19th out of 190 countries in the World Bank's Ease of Doing Business rating of 2020 (see Table). In the case of the nascent entrepreneur, the odds are substantially higher for all countries (except Slovenia) than for the other two categories. This means that the chances of being a nascent entrepreneur in Bulgaria are much lower than in any other country.

Overall, demographic variables, entrepreneurship-related traits, social capital, and country dummies are influential determinants of entrepreneurial activity at the early stages. However, the determinants are slightly different depending on the entrepreneurial category. For instance, higher education and a promising career positively impact the probability of having entrepreneurial intentions, but being employed is not relevant for this category. Moreover, higher education, a promising career, and a middle-income group are not relevant to the likelihood of being a nascent or early-stage entrepreneur. Start-up skills, knowing other entrepreneurs, and opportunity are the most influential determinants of entrepreneurial intention. Being employed, having start-up skills, and knowing other entrepreneurs significantly impact nascent and early-stage entrepreneurs.

Gender gap in entrepreneurial activity at the early stages

To examine the contribution of each covariate to the gender disparity in the three entrepreneur categories, Fairlie's decomposition techniques applying pooled coefficients are used. These analyses are based on the same sample used for the logit regressions in the previous section. It is noteworthy that the gender gap in entrepreneurial activity arises from differences in the covariates (explained part) and estimated coefficients (unexplained part). In this respect, the explanatory variables that were statistically significant in the logit regressions may not be significant in accounting for the gap if the distribution of determinants is similar between women and men.

The result of the decomposition analysis is shown in Table 5. In the potential entrepreneur category, 16.1% of men intend to start a business within the next three years, whereas 9.9% of women have an entrepreneurial intention, implying a difference of 6.1 percentage points. For early-stage entrepreneurs, 10.6% of men and 6.5% of women are early-stage entrepreneurs, indicating a gap of 4.1 percentage points. The share of nascent entrepreneurs is much lower. Just 6.9% of men and 4.3% of women are nascent entrepreneurs, suggesting a disparity of 2.6 percentage points. This result is similar to Bönnte–Piegeler (2013) findings, in which they found a gender

gap of 2.9 and 7.7 percentage points for nascent and latent entrepreneurs, respectively.

Table 5

Fairlie's decomposition of the gender gap in entrepreneurial activities

Denomination	Potential entrepreneurs		Nascent entrepreneurs		Early-stage entrepreneurs	
	coefficient	contribution, %	coefficient	contribution, %	coefficient	contribution, %
Age	-0.0043*** (0.0005)	-7.0	-0.0032*** (0.0004)	-12.4	-0.0048*** (0.0004)	-11.3
Higher education	-0.0005** (0.0002)	-0.8	-0.0003* (0.0002)	-1.3	-0.0010*** (0.0003)	-2.4
Employed	-0.0001 (0.0006)		0.0010*** (0.0002)	3.7	0.0019*** (0.0003)	4.6
HH income: Middle 1/3	0.0018*** (0.0005)	2.9	0.0006 (0.0004)		0.0010** (0.0005)	2.5
HH income: Upper 1/3	0.0032*** (0.0009)	5.2	0.0012** (0.0005)	4.5	0.0021*** (0.0006)	5.0
Opportunity	0.0010*** (0.0003)	1.7	0.0004*** (0.0002)	1.7	0.0006*** (0.0002)	1.5
Know entrepreneur	0.0021*** (0.0005)	3.4	0.0018*** (0.0003)	7.0	0.0034*** (0.0004)	8.2
Start-up skills	0.0111*** (0.0009)	18.2	0.0070*** (0.0006)	26.7	0.0113*** (0.0008)	27.7
Fear failure	0.0017*** (0.0005)	2.8	0.0026*** (0.0005)	10.1	0.0033*** (0.0006)	8.0
Promising career	0.0000 0.0001		0.0001 (0.0001)		0.0000 -0.0048	
Estimated mean difference	0.061		0.026		0.041	
Total explained	0.016		0.011		0.018	
% Explained	26.2		42.6		43.4	

Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

The gender disparities in covariates explain 26.2% of the gender gap in entrepreneurial intentions, 42.6% of the gender gap in nascent entrepreneurs, and 43.4% of the gender gap in early-stage entrepreneurs.⁹ Looking at the contribution of each explanatory variable to the gender gap, a few variables explain a more significant fraction of the gender gap. Namely, gender differences in start-up skills have the most substantial effect on increasing the gender gap in three entrepreneur categories. It

⁹ The sum of the contributions of all covariates calculates the fraction of the gap explained by all covariates.

explains 18.2–27.7% of the overall gender gaps. Knowing other entrepreneurs and fear of failure also significantly raise the gender gap, especially for nascent and early-stage entrepreneurs. Gender differences in knowing other entrepreneurs contribute 7.0% and 8.2% to the gender gap for nascent and early-stage entrepreneurs, respectively. The contribution of fair failure to the gender gap is 10.1% for nascent entrepreneurs and 8.0% for early-stage entrepreneurs. Gender disparity in upper household income contributes similarly to the gender gap in the three entrepreneur categories, describing between 4.5% and 5.2% of the gender gap. In contrast, age and higher education reduce the gender gap in the three categories of entrepreneurs. These results fit with the outcome of Bernat et al. (2017). The proportion of women with a graduate degree is higher than that of men for all entrepreneur categories, reducing the gender gap in entrepreneurial activities.

In summary, the results suggest that women's lower entrepreneurial-related variables (start-up skills, fear of failure, and opportunity) and social capital (knowing other entrepreneurs) contribute to the gender gap in entrepreneurial activities, confirming Hypotheses 2a and 2b. However, there is no evidence to support the contribution of societal attitudes to the gender gap. In addition to higher household income, demographic variables play a minor role in explaining the gender gap and may even favor female entrepreneurship.

Conclusion

In this paper, I first identify individual characteristics, social capital, and societal attitude related to entrepreneurial activity at the early stages in the seven CEE countries. Second, I calculate the contribution of each determinant to the gender gap in entrepreneurial activities. Entrepreneurship at the early stages includes entrepreneurial intentions, nascent, and early-stage entrepreneurship. The average rate for an individual's intention to start a business within three years is 12.2%, with a gender gap of 39% in the selected CEE countries. On average, 6.6% of individuals are in the process of starting a business (nascent entrepreneurs), and 9.4% have early-stage businesses, with similar gender gaps ranging from 32% to 35%.

Gender, age, higher education, employment, and higher household income influence entrepreneurial activity levels. In all countries, men are more likely than women to establish new firms, younger people are more likely to do so than older people, and individuals with higher incomes are more likely to start a business than those with lower incomes. In particular, women's engagement in entrepreneurial activity is relatively low among potential entrepreneurs compared to nascent and early-stage entrepreneurs in CEE countries. The inconsistent effects of higher education and being employed in entrepreneurial activities in the early stages are worth noting. Higher education is positively and significantly associated with the probability of being a potential entrepreneur. At the same time, it is irrelevant to the

likelihood of being a nascent or early-stage entrepreneur. In contrast, being employed positively and significantly impacts the probabilities of being a nascent and early-stage entrepreneur, whereas it is not statistically significant for potential entrepreneurs.

For individual entrepreneurship-related traits, variables such as start-up skills and knowing other entrepreneurs significantly increase the probability of being an entrepreneur at all stages of entrepreneurship. However, the three stages of entrepreneurship are limited by the fear of failure, especially for nascent and early-stage entrepreneurs in all countries. Nascent and early-stage entrepreneurs may be somewhat afraid of failure because they have already taken the first steps toward running a business. Individual demographic and personal characteristics related to entrepreneurship are all important. Nevertheless, the national context appears to be far more important because the levels of entrepreneurship are higher in more prosperous countries.

Regarding the gender gap results, the overall gender gaps range from 2.6 to 6.1 percentage points. The largest gender gap is found for potential entrepreneurs, implying that women are less motivated to start a business in CEE countries. A total of 26.2% of the gender gap in potential entrepreneurs, 42.6% of the gender gap in nascent entrepreneurs, and 43.4% of the gender gap in early-stage entrepreneurs can be explained by the gender differences in explanatory variables. Determinants such as start-up skills and higher household income considerably contribute to the gender gap in entrepreneurial intentions. Variables such as start-up skills, fear of failure, and knowing other entrepreneurs significantly contribute to the gender gap for nascent and early-stage entrepreneurs.

Identifying the contribution of determinants in the gender gap to entrepreneurial activity at various stages is useful for public policies because it allows policy-makers to implement policies tailored to each stage of the entrepreneurial process. The findings suggest that governments should take the following actions to narrow the gender gap in entrepreneurial activities in the early stages: (i) strengthening women's start-up skills through business education, (ii) expanding women's access to finance, (iii) supporting women-oriented networks within entrepreneurial society, and (iv) empowering women to manage potential risks.

Although this study examined an individual's ability to perceive promising opportunities in entrepreneurial activities and its contribution to the gender gap in entrepreneurship, it did not investigate the role of motivation to start a business, particularly necessity-driven entrepreneurship, due to data incompatibility. People commonly start businesses due to a lack of alternative economic support or employment or to pursue entrepreneurial opportunities. Gender disparities in these entrepreneurial motives might contribute to the gender gap in entrepreneurship. In most countries, women are more likely than men to say they started a business out of necessity. In contrast, male entrepreneurs are likelier to report an opportunity motive than female entrepreneurs (Elam et al. 2019).

This pattern may be seen in the selected CEE countries other than Poland and Latvia for early-stage entrepreneurs. The necessity motive plays a crucial role in women's TEA in Bulgaria, Slovenia, and Croatia, where almost one-third of female entrepreneurs began their businesses out of necessity. This resulted in the highest gender disparity in necessity motives in Bulgaria and Slovenia, where approximately 11.5 percent more female entrepreneurs reported starting businesses out of necessity than male entrepreneurs. The highest gender disparity in opportunity motives was also identified in these two countries, where women entrepreneurs were approximately 9.5 percent less likely than male entrepreneurs to indicate opportunity as a motive for starting a business. In Poland and Latvia, however, the pattern is reversed: women are more likely than men to report opportunity motives, while males are more likely to express necessity motives. Poland, in particular, has one of the lowest rates of necessity-driven female entrepreneurship in the European region and one of the highest rates of opportunity-driven female entrepreneurship (Elam et al. 2019). Therefore, future research should look into the opposite position of gender in entrepreneurial motives in CEE countries.

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Appendix

Table A1

Economic and labor market indicators for the selected countries

Countries	(1)		(2)		(3)	(4)	(5)	
	GDP per capita, 2020 (constant 2015 USD)		Economic development phase		SME contribution to GDP, 2015, %	World Bank Ease of Doing Business Rating (2020): Rank from 190 countries	World Bank Starting a Business Rating (2020): Rank from 190 countries	
Poland	14,588		Efficiency driven		52	40	128	
Estonia	19,736		Innovation Driven		75	18	14	
Croatia	12,694		Efficiency driven		56	51	114	
Latvia	15,488		Efficiency driven		72	19	26	
Slovenia	22,915		Efficiency driven		63	37	41	
Slovakia	17,252		Efficiency driven		57	45	118	
Bulgaria	8,050		Efficiency driven		66	61	113	
EU-27								
Countries	(6)		(7)		(8)	(9)	(10)	
	Unemployment rate, 2020 (%)		Employment rate, 2020 (%)		Ratio of female to male labor force participation rate, 2019, %	Gender pay gap, 2019, %	Share of informal employment in the total employment	
	female	male	female	male			female	male
Poland	3.3	3.1	63.6	78.3	73.7	8.5	32.7	42.2
Estonia	6.6	7.0	76.3	82.2	81.5	21.7	6.1	7.6
Croatia	7.6	7.5	61.6	72.6	77.9	11.5	11.8	14.0
Latvia	7.1	9.1	75.6	80.6	81.7	21.2	11.5	15.1
Slovenia	5.6	4.4	71.9	77.1	84.9	7.9	3.5	6.3
Slovakia	7.1	6.4	66.4	78.3	77.5	18.4	12.1	20.7
Bulgaria	5.0	5.4	67.0	75.8	79.26	14.1	13.9	17.6
EU-27	7.4	6.8	67.8	78.2	–	14.1	–	–

Sources for columns: (1), (4), (5), (8) World Bank; (2)-(3) GEM 2017/2018 Global Report; (6), (7), (9) E.U. Labor Force Survey, Eurostat; (10) International Labor Organization.

Table A2

Descriptive statistics, 2017

(%)

Variables	Nascent entrepreneur			Non-nascent entrepreneur	Potential entrepreneur			Non-potential entrepreneur
	male	female	total		male	female	total	
Observation number	789	548	1,337	19,011	1,529	951	2,480	17,810
Poland	37	45	40.4	39.5	33	26	30	41
Slovakia	12	12	12.3	9.7	10	12	11	10
Slovenia	6	3	4.7	10.2	10	9	10	10
Croatia	10	8	9.0	9.9	16	18	17	9
Estonia	20	18	19.2	10.7	14	14	14	11
Latvia	12	11	11.8	9.7	12	17	14	9
Bulgaria	2	3	2.6	10.3	4	4	4	11
Female	–	–	41	51.3	–	–	38	52
Age (mean)	39.0	38.8	38.9	44.3	37.6	38.7	38.0	44.8
Education (individuals with higher education)	9	14.4	11.2	8.6	8.1	15.6	10.9	8.4
Employed	89.9	89.3	87.8	69.9	83.9	73.3	79.8	71.2
H.H. income								
Lower 1/3	18.46	21.2	19.6	33.0	23.1	27.9	24.9	33.2
Middle 1/3	25.0	29.6	26.8	35.1	25.7	31.6	28.1	35.6
Upper 1/3	56.5	49.1	53.6	31.6	51.2	40.3	46.9	31.2
Opportunity	45.0	44.9	44.9	33.1	42.3	42.6	42.4	32.7
Know entrepreneur	57.3	56.6	57.0	36.9	52.2	47.3	50.3	36.6
Start-up skills	68.4	63.9	66.6	44.4	64.7	62.6	63.9	43.3
Fear of failure	29.9	35.0	32.0	42.3	34.23	35.37	34.67	42.7

(Table continues on the next page.)

(Continued.)

Variables	Early-stage entrepreneur			Nonearly-stage entrepreneur	Total
	male	female	total		
Observation number	1,149	769	1,918	18,430	20,348
Poland	35	41	37	40	39.5
Slovakia	12	13	12	10	9.8
Slovenia	7	4	6	10	9.9
Croatia	9	9	9	10	9.8
Estonia	21	18	20	10	11.3
Latvia	12	12	12	10	9.8
Bulgaria	4	4	4	10	9.8
Female	–	–	40	52	50.7
Age (mean)	38.9	38.6	38.9	44.5	43.97
Education (individuals with higher education)	10.7	15.9	12.8	8.3	8.7
Employed	92.2	90.9	91.7	70.2	71.2
H.H. income					
Lower 1/3	17.0	23.1	19.4	33.5	32.2
Middle 1/3	24.6	30.1	26.8	35.4	34.6
Upper 1/3	58.4	46.8	53.8	31.1	33.2
Opportunity	45.3	44.6	45.0	32.8	33.9
Know entrepreneur	59.6	57.1	58.6	36.2	38.3
Start-up skills	70.1	66.7	69.1	43.5	45.8
Fear of failure	30.1	33.1	31.3	42.9	41.7

Source: Author's calculation from GEM 2017 APS Global Individual-Level data.

REFERENCES

- AABOEN, L.–DUBOIS, A.–LIND, F. (2013): Strategizing as networking for new ventures *Industrial Marketing Management* 42 (7): 1033–1041.
<https://doi.org/10.1016/j.indmarman.2013.07.003>
- ABU BAKAR, A. R.–AHMAD, S.–WRIGHT, N.–SKOKO, H. (2017): The propensity to business startup: Evidence from Global Entrepreneurship Monitor (GEM) data in Saudi Arabia *Journal of Entrepreneurship in Emerging Economies* 9 (3): 263–285.
<https://doi.org/10.1108/JEEE-11-2016-0049>
- AGUILAR, E. C. (2022): Regional systems of entrepreneurship in 2017–2018: An empirical study in selected regions of South America *Regional Statistics* 12 (1): 51–76.
<https://doi.org/10.15196/RS120103>
- ÁLVAREZ, C.–URBANO, D.–AMORÓS, J. E. (2014): GEM research: Achievements and challenges *Small Business Economics* 42 (3): 445–465.
<https://doi.org/10.1007/s11187-013-9517-5>
- ARENIUS, P.–MINNITI, M. (2005): Perceptual variables and nascent entrepreneurship *Small Business Economics* 24 (3): 233–247. <https://doi.org/10.1007/s11187-005-1984-x>
- BERNAT, L. F.–LAMBARDI, G.–PALACIOS, P. (2017): Determinants of the entrepreneurial gender gap in Latin America *Small Business Economics* 48 (3): 727–752.
<https://doi.org/10.1007/s11187-016-9789-7>

- BLANCHFLOWER, D. (2004): *Self-employment: More may not be better* National Bureau of Economic Research Working Paper Series, No. 10286. National Bureau of Economic Research, Cambridge, MA. <https://doi.org/10.3386/w10286>
- BÖNTE, W.–PIEGELER, M. (2013): Gender gap in latent and nascent entrepreneurship: Driven by competitiveness *Small Business Economics* 41 (4): 961–987. <https://doi.org/10.1007/s11187-012-9459-3>
- CALIENDO, M.–FOSSEN, F.–KRITIKOS, A.–WETTER, M. (2015): The gender gap in entrepreneurship: Not just a matter of personality *CESifo Economic Studies* 61: 202–238. <https://doi.org/10.1093/cesifo/ifu023>
- CLERCQ, D. D.–ARENIUS, P. (2006): The role of knowledge in business start-up activity *International Small Business Journal* 24 (4): 339–358. <https://doi.org/10.1177/0266242606065507>
- DE VITA, L.–MARI, M.–POGGESI, S. (2014): Women entrepreneurs in and from developing countries: Evidences from the literature *European Management Journal* 32 (3): 451–460. <https://doi.org/10.1016/j.emj.2013.07.009>
- FAIRLIE, R. (2005): An extension of the Blinder-Oaxaca decomposition technique to logit and probit models *Journal of Economic and Social Measurement* 30 (4): 305–316. <https://doi.org/10.3233/JEM-2005-0259>
- HOSMER, D. W.–LEMESHOW, S.–STURDIVANT, R. X. (2013): *Applied logistic regression* (Third edition), John Wiley & Sons, Inc.
- KERR, S. P.–KERR, W. R.–XU, T. (2018): Personality traits of entrepreneurs: A review of recent literature *Foundations & Trends in Entrepreneurship* 14 (3): 279–285. <https://doi.org/10.1561/03000000080>
- KING, G.–ZENG, L. (2001): Logistic regression in rare events data *Political Analysis* 9 (2): 137–163. <https://doi.org/10.1093/oxfordjournals.pan.a004868>
- KIRZNER, I. M. (1979): *Perception, opportunity, and profit: Studies in the theory of entrepreneurship* The University of Chicago Press.
- KOELLINGER, P.–MINNITI, M.–SCHADE, C. (2013): Gender differences in entrepreneurial propensity *Oxford Bulletin of Economics and Statistics* 75 (2): 213–234. <https://doi.org/10.1111/j.1468-0084.2011.00689.x>
- KOMLÓSI, É.–PÁGER, B. (2015): The impact of urban concentration on countries' competitiveness and entrepreneurial performance *Regional Statistics* 5 (1): 97–120. <https://doi.org/10.15196/RS05106>
- LANGOWITZ, N.–MINNITI, M. (2007): The entrepreneurial propensity of women *Entrepreneurship Theory and Practice* 31 (3): 341–364. <https://doi.org/10.1111/j.1540-6520.2007.00177.x>
- LIN, Z.–PICOT, G.–COMPTON, J. (2000): The entry and exit dynamics of self-employment in Canada *Small Business Economics* 15 (2): 105–125. <https://doi.org/10.1023/A:1008150516764>
- LINS, E.–LUTZ, E. (2016): Bridging the gender funding gap: Do female entrepreneurs have equal access to venture capital? *International Journal of Entrepreneurship and Small Business* 27 (2–3): 347–365. <https://doi.org/10.1504/IJESB.2016.073993>
- MAULA, M.–AUTIO, E.–ARENIUS, P. (2005): What drives micro-angel investments? *Small Business Economics* 25 (5): 459–475. <https://doi.org/10.1007/s11187-004-2278-4>

- MINHTAM, T. B.–LEETRAKUN, P. (2020): Starting up a business in ASEAN: A gender perspective. In: JOSSI, D. U.–BASSARD, C. (eds.): *Urban spaces and gender in Asia* pp. 65–91., Springer International Publishing.
https://doi.org/10.1007/978-3-030-36494-6_5
- POSCHKE, M. (2013): Who becomes an entrepreneur? Labor market prospects and occupational choice *Journal of Economic Dynamics and Control* 37 (3): 693–710.
<https://doi.org/10.1016/j.jedc.2012.11.003>
- RAMOS-RODRÍGUEZ, A. R.–MEDINA-GARRIDO, J. A.–RUIZ-NAVARRO, J. (2012): Determinants of hotels and restaurants entrepreneurship: A study using GEM data *International Journal of Hospitality Management* 31 (2): 579–587.
<https://doi.org/10.1016/j.ijhm.2011.08.003>
- SETTI, Z. (2017): Entrepreneurial intentions among youth in MENA countries: Effects of gender, education, occupation and income *International Journal of Entrepreneurship and Small Business* 30 (3): 308–324. <https://doi.org/10.1504/IJESB.2017.081952>
- SIMÕES, N.–CRESPO, N.–MOREIRA, S. B. (2016): Individual determinants of self-employment entry: What do we really know? *Journal of Economic Surveys* 30 (4): 783–806.
<https://doi.org/doi:10.1111/joes.12111>
- VAN DER SLUIS, J.–VAN PRAAG, M.–VIJVERBERG, W. (2008): Education and entrepreneurship selection and performance: A review of the empirical literature *Journal of Economic Surveys* 22 (5): 795–841.
<https://doi.org/10.1111/j.1467-6419.2008.00550.x>
- WAGNER, J. (2007): What a difference a Y makes—female and male nascent entrepreneurs in Germany *Small Business Economics* 28 (1): 1–21.
<https://doi.org/10.1007/s11187-005-0259-x>
- WENNEKERS, A.–UHLANER, L.–THURIK, R. (2002): Entrepreneurship and its conditions: A macro perspective *International Journal of Entrepreneurship Education* 1 (1): 25–64.
- ZHANG, C.–SCHÖTT, T. (2017): Young employees' job-autonomy promoting intention to become entrepreneur: Embedded in gender and traditional versus modern culture *International Journal of Entrepreneurship and Small Business* 30 (3): 357–373.
<https://doi.org/10.1504/IJESB.2017.081974>

INTERNET SOURCES

- BOSMA, N.–LITOVSKY, Y.–CODURAS, A.–SEAMAN, J.–CARMONA, J.–WRIGHT, F. (2017): *GEM Manual: A report on the design, data and quality control of the global entrepreneurship monitor* Global Entrepreneurship Monitor.
<https://www.gemconsortium.org/report/gem-manual-design-data-and-quality-control> (downloaded: August 2022)
- ELAM, A.–BRUSH, C.–GREENE, P.–BAUMER, B.–DEAN, M.–HEAVLOW, R. (2019): *GEM 2018/2019 Women's entrepreneurship report* Global Entrepreneurship Monitor.
<https://www.gemconsortium.org/report/gem-20182019-womens-entrepreneurship-report> (downloaded: August 2022)