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DETERMINANTS OF ENTREPRENEURS IN LOGISTIC INDUSTRY: GEM STUDY ANALYSIS

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Abstract. *The subject of this paper's analysis are the determinants of entrepreneurs in the early stages of the development of their ventures in logistic industry. The goal is to identify the factors that influence the decision to engage in entrepreneurial activity in the logistics sector. For the analysis, the Global Entrepreneurship Monitor (GEM) database was used, from which 73,806 respondents from European countries were filtered, of which 192 were from the field of logistics. Statistical analysis was performed using the statistical analysis software package Stata IC 15.0. The research covers demographic factors, growth factors, internationalization factors and motivational factors. Demographic factors (gender, age, work status) are statistically significant for entrepreneurs in the field of logistics. Men are more likely to be entrepreneurs in the logistics sector. The 18 to 25 and 45 to 54 age groups are most likely to engage in these ventures. Self-employed is the predominant work status of these entrepreneurs. Entrepreneurs in the field of logistics are characterized by the expectation of an increase in the number of employees, as well as a significant percentage of realized income from abroad. Financial motivators are what drive entrepreneurs in the logistics sector.*

Key words: *Logistics, entrepreneurship, growth, internationalization, motivation.*

JEL Classification: M21

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1. INTRODUCTION

The story of logistics is always current and attracts a lot of attention from researchers, as evidenced by the abundance of research and writing in this area. Fierce competition on the global market, shortening of product life cycles, technological innovations, digital transformation of companies, and changes in customer expectations direct attention to the logistics sector. Logistics includes all activities that enable customers to receive the right products, in the right quantity and at the right time (Kasilingam, 1998). Harrison et al., (2019) see logistics as a subset of the supply chain. They point out that the logistics task is to manage the flow of physical goods and information within the supply chain. The Council of Logistics Management defines logistics as the process of planning, implementing, and controlling the efficiency, flow and storage of goods, services, and related information, from the point of origin to the point of consumption to comply with customer requirements. Successful management of logistics activities requires a focus on every facility that affects the process of matching products with customer requirements. The quality of logistics services is one of the key factors of the business environment that improves the long-term relationship between logistics service providers and customers (Nedeliaková et al., 2014). In addition, logistics activities should be cost-effective for the entire system. This means minimizing system costs, which include transportation, distribution, and storage costs. The emphasis is not on the simple minimization of these costs, but on the systematic application of management logic. Logistics service providers are forced to adapt their strategies and bring innovation to ensure low-cost service and delivery according to customer requirements and expectations. The story of innovation in logistics leads mainly to entrepreneurs in this field (Sousa-Zomer & Miguel, 2018). Entrepreneurs change their strategies more easily, react to changes faster and find solutions to new challenges. They will create more innovative products, thereby improving the use of resources and contributing to the improvement of logistics activities. Understanding the involvement of small entrepreneurs in the logistics sector is the focus of this research. The goal is to identify the determinants that have a decisive influence on the choice of an entrepreneur's career in the field of logistics. The structure of the work is as follows. The literature relevant to this field was analysed. The influence of demographic factors on the career choice of entrepreneurs in the field of logistics is considered. In addition, the factors of growth, internationalization of business and motivation are also in focus, as important determinants of entrepreneurs in the field of logistics. Data from the Global Entrepreneurship Monitor (GEM) database was used for the analysis. The methodology and results are presented below. The task included determining the common characteristics of nascent entrepreneurs and entrepreneurs whose venture is in the incubation period, from the European area. At the end, there will be a discussion and concluding messages.

2. THEORETICAL BACKGROUND

Logistics is a big word for a big challenge (Harrison & Sar, 2019). It refers to the process of moving and coordinating resources, such as food, materials, equipment and even people, from one location to another. Logistics includes activities aimed at guaranteeing the efficiency and effectiveness of all procedures related to the movement of all types of resources from the place of origin to the destination, while meeting the required quality, including the reliability of information and the sensitivity of customer needs (Domingues

et al., 2015). The profitability of the company is largely conditioned by the costs caused by logistics, which justifies the focus on this area (Vuković et al., 2020). According to the areas, logistics can be procurement, production, sales, recovery, and recycling logistics (Ruziyev & Bakhriddinova, 2022). It can be viewed through two dimensions. The first dimension includes movement, storage, and "reordering", as the three operational activities that make up logistics. Their value addition is based on place, time, and handling (3P). Place matters in the sense of moving from a location of less to a location of greater value to the customer. Timing and pacing refer to adding time value, which means making it possible to bridge the time gaps between when products are available and when customers need them. Handling of materials implies arrangement in specific quantities and samples (collection, packaging, sorting). The second dimension refers to supply chain management, which involves coordinating processes and harmonizing the flow of information, money, products, and ideas (Sheffi & Klaus, 1997). In this sense, dynamic solutions are key, which can respond to existing situations, but can be adapted and changed. It is necessary to build sustainable systems that can respond to all challenges. The logistics system is one of the critical infrastructures that should ensure rational use of resources and easy access to services. All elements of the logistics system are interconnected, which concretely means that in certain situations, lower transportation costs can cause higher storage or inventory management costs. Entrepreneurs, as flexible and innovative actors in this sector, can find better solutions for harmonizing these activities than a corporation would. The development of other sectors is largely dependent on logistics. Entrepreneurs have contributed to the development and transformation of logistics, as entrepreneurship in the transport and supply chain sector can have a direct and significant impact on all activities (Negrutiu et al., 2020). These authors dealt with the concrete application of sustainable entrepreneurship in the transport and supply chain sector. They discussed the importance of the green entrepreneur, the digital freight forwarder, the platforms used in this area and thus showed the potential for innovation that entrepreneurs bring. Digitization of business opens new opportunities for entrepreneurs in logistics (Popkova et al., 2021). In their work, they proposed a conceptual model of digitalization of transport and logistics in Russia. Marshall et al. (2015) argues in their paper the strength of the link between entrepreneurship and supply chain sustainability. They are thrown by breaking down and managing cultural attributes, which are needed to establish social sustainability in supply chain management. The contribution of entrepreneurship in logistics business is also confirmed by Chienwattanasook et al. (2019), who emphasize corporate entrepreneurship. They concluded that corporate entrepreneurship has a major role for performance that is significant in logistics business. Entrepreneurial ventures are not initiated by chance and are the result of some planned behaviour (Ejsen, 1991). The author starts from the assumption that it is possible to single out key determinants that characterize an entrepreneur from this field. Understanding the involvement of entrepreneurs in the logistics sector imposes the need to understand the factors that decisively influence the choice of that sector. The research focuses on demographic factors, growth factors and factors of business internationalization and motivation factors.

2.1. Demographical factors

Demographics include age, gender, education, employment status, marital status, household size, and more. Demographic variables can explain entrepreneurial choice (Arafat & Saleem, 2017). Javalgi & Grossman (2016) point out that demographic characteristics are responsible for the orientation of entrepreneurs and the search for new opportunities. Haus et al. (2013) reviewed the literature related to starting entrepreneurial ventures from the perspective of gender and concluded that men are at an advantage. This is supported by later research (Tsai et al., 2016; Arafat & Saleem, 2017). The explanations for this situation are mainly related to the fact that men's propensity to risk is much lower, then through the pressures of the family and work environment, which are much greater for women, and the very specificity of jobs in the logistics sector, which are not too attractive for women. Various studies provide a mixed picture of the influence of age on entrepreneurial choice. Older people are characterized by a much higher level of responsibility, widespread networks of acquaintances, more knowledge and experience, while younger entrepreneurs are closer to new technologies, are more energetic, have greater potential for development and improvement, because they do not know their limits (Arenius & Minniti, 2005). Aging is usually seen in a negative relationship with the initiation of entrepreneurial ventures (Janssen, 2003; Brixy & Hessels, 2010), because age is associated with a lack of creativity and innovation, a greater aversion to risk and a desire for a secure job. For entrepreneurs in the field of logistics, the situation is different. Carrying out work in the field of logistics requires experience and knowledge in this field, financial resources, means of transport, construction facilities and a wide network of acquaintances. This takes time and all this is acquired over years, so it is unlikely that a young person will create these prerequisites and start his venture in the logistics sector. For this reason, it is more likely to expect a positive relationship between the age of doing logistics (Pindado Tapia % Sánchez García, 2017; Zagata & Sutherland, 2015). Work status is a factor considered statistically significant for entrepreneurial intentions (Startiene & Remeikiene, 2009). The assumption is that the category of self-employed compared to other categories carries the highest probability of starting a business in this sector (Arafat & Saleem, 2017). In the analysis, the author considers the size of the household as an important determinant of entrepreneurs in the logistics sector. The literature presents the effect of family size on entrepreneurs in an ambiguous way. On the one hand there are those who claim that larger families will have the effect of dissuading a person from entrepreneurial engagement, since they are constantly in a situation where they must sacrifice time spent with their family for the sake of work (Shelton & John, 1996). On the other hand, it is said that a larger number of household members will positively influence the growth of entrepreneurial ventures. A larger number of household members represents a source of labour, which can contribute to the enterprise. In addition, more members can indicate greater financial security of the family, which gives greater freedom for risk and entry into entrepreneurial waters (Raijman, 2001). The first hypothesis is based on the performed analysis:

H1: Demographic characteristics (age, employment status and household size) influence the probability of an entrepreneur's career choice in the logistics sector in Europe.

2.2. Growth factors

The impact of entrepreneurial ventures on the economic development of countries is realized through its growth in the form of creating new jobs, developing innovations, and entering foreign markets. Entrepreneurs contribute to the economic development of countries in different ways. Some of them want to develop new products and offer them to the market, some of them strive to expand their business and make additional hires in accordance with the needs of the company, while some see their chance in entering other markets. This is also the main reason for the inclusion of these elements in the research by the Global Entrepreneurship Monitor. The importance of the analysis of the mentioned elements is especially highlighted during the early phase of the entrepreneurial process, including entrepreneurs, owners whose ventures have not yet completed 42 continuous months of paid wages. The desire to grow an entrepreneurial venture represents a clear link between entrepreneurship and one of the most important goals of governments of all countries highlighted in the form of creating new jobs (Oyelola et al., 2013). The interest in researching the growth of entrepreneurial ventures is understandable due to the identification of the various impacts of entrepreneurship on the economy of countries, especially in the area of the potential for creating new jobs, which in crisis periods, in conditions of falling economic activity and the employment rate, represents a source of data for harmonizing the enactment and adoption of various strategies, measures and policies by the governments of individual countries. Entrepreneurship as a discipline has become a very interesting subject of study and consideration by numerous researchers (Khan et al., 2005; Stam et al., 2012; Estrin et al., 2022). Entrepreneurship draws interest in research in this area from numerous facts as well as active promotions . Entrepreneurship represents the basis of economic activities of developed countries; developed entrepreneurial initiative is a characteristic of the economy of highly developed countries. It affects economic development, affects the increase in the employment rate through the generation of new jobs, etc. The creation of new jobs is the result of the entrepreneur's desire to achieve the growth of the entrepreneurial venture (Karadeniz & Özçam, 2010; Petrović & Leković, 2019). It is a big contribution to the economic development of countries because many newly founded companies have an enviable potential for the growth of enterprises and the creation of new jobs. The entrepreneurship literature recognizes two sources of economic growth through entrepreneurship development. The first ones represent already existing, developed, successful small, medium, and large companies that arose based on entrepreneurial ventures, while the second source is recognized in the form of new and growing companies, entrepreneurs who are in the early stages of the entrepreneurial process. According to the GEM methodology, this group of entrepreneurs is identified as individuals who are personally involved in the creation of a new entrepreneurial venture. They are simultaneously owners/managers of a business that is not older than 48 months. In accordance with the above, the following hypothesis is put forward:

H2: Growth factors affect the probability of choosing an entrepreneurial career in the logistics sector in Europe.

2.3. Internationalization factors

Entrepreneurs, as carriers of the entrepreneurial process, based on the observation and profitable exploitation of identified opportunities, often find opportunities for the growth of their enterprise beyond the borders of their country. Along with the strengthening of the process of globalization of the world economy, in the previous decade there was also an interest in the internationalization of entrepreneurial ventures (Časas & Dambrauskaitė, 2011). The internationalization of business is not only related to the appearance of multinational companies but is also available to newly founded entrepreneurial ventures that, with the help of available technologies, innovative products/services, and available markets, find their chance for growth outside the framework of national economies (Alves et al., 2017). One of the important determinants influencing the decision to enter foreign markets is expressed through the size of the domestic market. Internationalization of business as a process of identifying and exploiting opportunities outside national frameworks can be viewed from two levels. From the perspective of the entrepreneur who identifies and makes decisions about the exploitation of perceived opportunities, and from the perspective of the company that enables the entrepreneur to profitably exploit the perceived opportunities. In today's time of globalization of business and in conditions of evident market liberalization, entrepreneurs and their ventures should take advantage of all the easier conditions for entering other markets (Castaño et al., 2016). The possibility of accessing other markets, tailoring the business offer according to consumer requirements, represents an opportunity for the growth of the company, which sometimes seems unattainable within national borders. The internationalization of business not only affects the growth of the company's business, but it also inevitably affects the development of innovations in products/services or processes. The internationalization of the company's operations provides contact with other companies from abroad, with competitors, consumers, suppliers, which is the basis for the development of open innovations. The successful development of innovations will represent the potential for the growth of the company's business due to a more successful performance on the domestic and international market, which ultimately brings the entrepreneurial venture to the more mature stages of the entrepreneurial process. Based on the analysed literature, the third hypothesis is defined:

H3: Internationalization of business affects the probability of choosing an entrepreneurial career in the logistics sector in Europe.

2.4. Motivation factors

Motivation is behind the decision to start a new business venture (Urban & Richard, 2015). It is the driving force behind entrepreneurial ventures. Every behaviour of an individual is basically motivated by certain motives. They are the reasons why someone is willing to change his attitudes, intentions, and activities. Motivation is the result of the action of internal and external factors, which results in investing effort in certain activities to achieve set goals. Human needs lead to tension, which results in motivation and undertaking certain activities to satisfy those needs. Because of this, it is important to understand motivational factors and use that knowledge to guide future entrepreneurs (Macfaraland et al., 2022). The Global Entrepreneurship Monitor (GEM) classifies entrepreneurs into 4 categories, depending on their motivation: motivated to make a change in the world, motivated to achieve high income and increase wealth, motivated to continue

family tradition and motivated to earn money due to lack of work. This classification arose from the classification in which we have two basic categories of motives, which are motives of chance and necessity (Reynolds et al., 1999, Hessels et al., 2008; Gurtoo & Williams, 2009). Chance motives explain starting a business that resulted from a perceived opportunity (Kautonen & Palmroos, 2010). Motives of necessity explain the initiation of a business venture due to unemployment or lack of other alternatives, so these entrepreneurs are said to be pushed into entrepreneurship (Block & Koellinger, 2009). It is important for policy makers to know the factors that are in the domain of their action on entrepreneurs in different sectors (Hessels et al., 2008). The consulted literature largely emphasizes financial motivators in early entrepreneurs. There are not enough works to motivate entrepreneurs in the logistics sector. This category of entrepreneurs is generally viewed together with other categories. Since the desire for the growth of these entrepreneurs was explained in the previous point, we will use it in this part. The available literature shows that expectations of venture growth are positively related to motives for increasing income (Morris et al., 2006; Cassar, 2007). Van Gelderen et al. (2008) say in their work that by working in an organization, the possibility of earning and increasing wealth is mostly fixed, while with self-employment, this possibility is unlimited. We cannot rule out the possibility that in the logistics sector we also have those who are pushed into entrepreneurship. The sample includes developed as well as developing countries, where there are entrepreneurs from the logistics sector who are largely dependent on their company, have limited access to human resources, technology, capital, which greatly reduces their ambitions for growth (Vijaya & Kamalanabhan, 1998; Morris et al., 2006; Hessels et al., 2008). The fourth hypothesis is based on the performed review:

H4: Motivational factors affect the probability of choosing an entrepreneurial career in the logistics sector in Europe.

3. METHODOLOGY

The Stata 15.0 software package was used to analyse the results. For research purposes, the Global Entrepreneurship Monitor (GEM) database from 2019 was used. GEM represents the most relevant database related to entrepreneurship. It is a global research consortium that aims to analyse the impact of entrepreneurship on national economic development. Global data at the national level were used, which, due to their comprehensiveness and conceptuality, provide results that do not lose their significance over time. The database should enable determining the determinants of logistics entrepreneurs in Europe, who are in the early stages of developing their ventures (TEA). The countries included in the analysis are Belarus, Croatia, Cyprus, Germany, Greece, Ireland, Italy, Latvia, Luxemburg, Netherlands, North Macedonia, Norway, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, and United Kingdom. Responses from European countries were filtered from the database, resulting in a sample of 73,806 early-stage entrepreneurs. Among them, 192 were identified from the logistics sector. TEA: Industry ISIC version 4, 1-digit code, which reflects the industrial sector of the entrepreneurial venture, was chosen as the dependent variable. For the purposes of conducting binary logistic regression, the dependent variable was recoded, which means that the logistics sector is marked with the number 1, while the other eleven sectors are marked with 0. The independent variables are grouped into four groups of factors, as presented in Table 1.

Table 1 Variables

Factors	Variables
Demographical factors	Gender
	Age
	Household size
	Work status
Growth factors	Exp. job growth ≥ 10 persons and ≥ 50 %
Internationalization factors	Strong international orientation (more than 25% of revenue from outside country)
Motivation factors	To make a difference in the world
	To build great wealth or a very high income
	To continue a family tradition
	To earn a living because jobs scarce

Source: Authors based on GEM database

Demographic factors (gender, age, household size and employment status), growth factors, business internationalization factors and motivational factors were considered. Table 2 presents the research sample.

Table 2 Research sample

Sector		Gender		Age		Work status		Education	
Other	73,614	Male	36,557	0-17	0	Full time	36,179	None	2.023
Logistic sector	192	Female	37,249	18-24	8,008	Part time	6,688	Some secondary	11.567
				25-34	14,332	Retired, disabled	9,855	Secondary degree	27.313
				35-44	16,475	Homemaker	3,202	Post-secondary	25.795
				45-54	16,375	Student	3,506	Grad EXP	7.109
				55-64	15,130	Not working	5,450		
				65-120	3,486	Self-employed	8,926		

Source: Authors based on GEM database

4. RESULTS

We start the presentation of the results with descriptive statistics, which is presented in Table 3.

Descriptive statistics show us that logistics in the early stages of entrepreneurial ventures are handled more by men than by women. The age of entrepreneurs in this field is generally between 45 and 54 years old. Another logical conclusion is related to their work status since it is dominated by self-employment. Over 80% of the respondents from the logistics sector expect the growth of their company and generate over 25% of revenue from abroad. In terms of motivation, we see that they are dominantly motivated by money.

Table 3 Descriptive statistics

	Sector	
	Other	Logistic sector
Gender		
Male	49%	72%
Female	51%	28%
Age		
0-17	0%	0%
18-24	11%	11%
25-34	19%	22%
35-44	22%	26%
45-54	22%	30%
55-64	21%	10%
65-120	5%	1%
Work status		
Full time	49%	38%
Part time	9%	4%
Retired, disabled	13%	3%
Homemaker	4%	1%
Student	5%	1%
Not working	7%	3%
Self-employed	12%	52%
Growth expectation		
Yes	99%	82%
No	1%	18%
International orientation		
Yes	99%	81%
No	1%	19%
Motivation		
To make a difference in the world		
No	50%	50%
Yes	50%	50%
To build great wealth or a very high income		
No	50%	40%
Yes	50%	60%
To continue a family tradition		
No	98%	67%
Yes	2%	33%
To earn a living because jobs are scarce		
No	50%	42%
Yes	50%	58%

Source: Authors based on GEM database

Table 4. represents the Logit model. The model is statistically significant because $p<0.05$, and "Pseudo r" is 15.88%.

Table 4 Logit model

TEAISIC4_1D	Coef.	Std. Err.	Z	P>z	[95% Conf.	Interval]
2.gender	-0.5789	0.1657	-3.49	0	-0.9036626	-0.2541418
age9c						
25-34	-0.3682	0.2762	-1.33	0.182	-0.909502	0.1730084
35-44	-0.2749	0.2722	-1.01	0.312	-0.8084894	0.2585962
45-54	-0.0351	0.2685	-0.13	0.896	-0.561423	0.4911488
55-64	-0.9722	0.3327	-2.92	0.003	-1.624217	-0.3201843
65-120	-1.3022	0.7745	-1.68	0.093	-2.820212	0.2157906
Hhsize	-0.0562	0.0558	-1.01	0.314	-0.165606	0.0532728
Gemoccu						
Part time	-0.3078	0.3789	-0.81	0.417	-1.0505	0.4348773
Retired, disabled	-0.7253	0.4887	-1.48	0.138	-1.683064	0.2324905
Homemaker	-1.2641	1.0126	-1.25	0.212	-3.248807	0.7206268
Student	-2.0136	1.0262	-1.96	0.05	-4.024918	-0.0023234
Not working	-0.6826	0.4656	-1.47	0.143	-1.595108	0.2298851
Self-employed	1.5072	0.1603	9.4	0	1.193017	1.821289
1.teayyjob	1.4621	0.2272	6.43	0	1.016685	1.907444
1.teaexpst	1.3827	0.2263	6.11	0	0.9390986	1.826302
teayymot1	-0.1856	0.0789	-2.35	0.019	-0.340281	-0.0309813
teayymot2	0.4376	0.0893	4.9	0	0.2626341	0.6125864
teayymot3	0.1269	0.0722	1.76	0.079	-0.0145402	0.2684389
teayymot4	0.2398	0.0847	2.83	0.005	0.0737097	0.4058663
_cons	-7.4686	0.5445	-13.72	0	-8.535875	-6.401299
Number of obs = 73 806, Log likelihood = -1122.5709, LR chi2(19) =423.81, Prob > chi2 = 0.0000, Pseudo R2 = 0.1588						

Source: Authors based on GEM database

When it comes to gender, the coefficient is negative and statistically significant. In the case of age in relation to the reference category, the statistically significant coefficient is at the age of 55-64 and it is negative. When it comes to work status, the coefficient in relation to the reference category is statistically significant and negative for the student category, and significant and positive for the self-employed category.

In terms of business growth expectations, the coefficient is statistically significant and positive. In case of internationalization of business, the coefficient is also statistically significant and positive. In the case of the motivation for engaging in entrepreneurship due to making a change in the world, the coefficient is statistically significant and negative. In the case of the motivation for engaging in entrepreneurship due to the increase in wealth and the realization of a high income, the coefficient is statistically significant and positive. In the case of the motivation to engage in entrepreneurship due to earning a living, because there is no other option for employment, the coefficient is statistically significant and positive.

To measure the connection of dependent variables with the decision to engage in entrepreneurship in the field of logistics, we focus on the concept of marginal effects. Table 5 shows their value.

The probability that males are engaged in logistics is 0.00316 and the probability that females are engaged in logistics is 0.00180 at the 0.05 significance level. There is a statistically significant difference between men and women in terms of the probability of being involved in logistics and that men are more likely to be involved in logistics than women.

Table 5 Marginal effects

	Margin	Std. Err.	Z	P>z	[95% Conf.	Interval]
Gender						
1	0.0031616	0.0002693	11.74	0	0.0026338	0.0036894
2	0.0018014	0.0002442	7.38	0	0.0013227	0.0022801
	dy/dx	Std. Err.	Z	P>z	[95% Conf.	Interval]
Gender	-0.00136	0.0003681	-3.7	0	-0.0020817	-0.0006388
	Margin	Std. Err.	Z	P>z	[95% Conf.	Interval]
TEAyyJOB						
0	0.0022507	0.0001787	12.59	0	0.0019005	0.002601
1	0.0093158	0.0018943	4.92	0	0.0056031	0.0130285
	dy/dx	Std. Err.	Z	P>z	[95% Conf.	Interval]
TEAyyJOB	0.0070651	0.0019103	3.7	0	0.003321	0.0108092
	Margin	Std. Err.	Z	P>z	[95% Conf.	Interval]
TEAEXPST						
0	0.0022509	0.0001795	12.54	0	0.0018991	0.0026027
1	0.0086453	0.0017499	4.94	0	0.0052155	0.0120751
	dy/dx	Std. Err.	Z	P>z	[95% Conf.	Interval]
TEAEXPST	0.0063944	0.0017678	3.62	0	0.0029296	0.0098592
	dy/dx	Std. Err.	Z	P>z	[95% Conf.	Interval]
TEAMOT1	-0.0004661	0.0002001	-2.33	0.02	-0.0008583	-0.0000738
	dy/dx	Std. Err.	Z	P>z	[95% Conf.	Interval]
TEAMOT2	0.0010987	0.000235	4.67	0	0.0006381	0.0015593
	dy/dx	Std. Err.	Z	P>z	[95% Conf.	Interval]
TEAMOT3	0.0003187	0.0001823	1.75	0.08	-0.0000386	0.0006761
	dy/dx	Std. Err.	Z	P>z	[95% Conf.	Interval]
TEAMOT4	0.000602	0.0002163	2.78	0.005	0.0001781	0.0010259

Source: Authors based on GEM database

The probability that an entrepreneur who does not expect an increase in the number of employees in the following period deals with logistics is 0.0022, and the probability for those who expect an increase is 0.0093 at a significance level of 0.05. This means that there is a statistically significant difference between those who expect growth and those who do not, regarding the choice of the logistics sector and that those who expect an increase in the number of employees are more likely to deal with logistics.

The probability that entrepreneurs who generate less than 25% of their income from abroad are engaged in logistics is 0.0022, and the probability for those who generate more than 25% of their income from abroad is 0.0086 at the 0.05 significance level. Based on the probabilities, we see that there is a statistically significant difference between the mentioned groups and that those who generate more than 25% of their income from abroad are more likely to deal with logistics.

There is a statistically significant difference between those who are motivated to engage in entrepreneurship to make changes in the world and those who do not, in terms of engaging in entrepreneurship in the field of logistics. A unit increase of this source of motivation will lead to a decrease in the probability of engaging in entrepreneurship in the field of logistics by 0.0004661 at a significance level of 0.05.

There is a statistically significant difference between those who are motivated to engage in entrepreneurship to increase their wealth and income compared to those who are not, in terms of engaging in entrepreneurship in the field of logistics. A unit increase in the importance of the source of motivation for increasing wealth and income will lead to an increase in the probability of engaging in entrepreneurship in the field of logistics by 0.0010987 at a significance level of 0.05.

The results showed that there is no statistical significance between the entrepreneur's decision to engage in logistics and the motivation stemming from the desire to continue the family business.

There is a statistically significant difference between those who are motivated to engage in entrepreneurship to earn a living due to lack of work and those who are not, in terms of engaging in entrepreneurship in the field of logistics. A unit increase of this source of motivation will lead to an increase in the probability of engaging in entrepreneurship in the field of logistics by 0.000602 at a significance level of 0.05. All tables should be numbered with consecutive Arabic numbers. They should have descriptive captions at the top of each table and should be mentioned in the text.

When it comes to the age of the respondents, the predicted probability of engaging in entrepreneurship in the field of logistics is highest for the categories of 18 to 24 years and 45 to 54 years. As for the 18-24 age category, the probability is 0.0036. The difference between this age category is statistically significant compared to the 55 to 64 category and amounts to -0.0022. In addition, the difference is statistically significant in relation to the over 65 category and amounts to -0.0026. For the category of 45 to 54 years, the probability is 0.0035, and the situation is identical in terms of statistically significant differences. For the category from 55 to 64 years old it is -0.0021, and for the category over 65 years old it is 0.0024.

The predicted probability of engaging in entrepreneurship in the field of logistics, when observing work status, is the highest for the self-employed category and amounts to 0.0082. All differences between the self-employed and other categories are statistically significant, which means that the self-employed have the highest probability of being entrepreneurs in the field of logistics compared to all other categories of work status.

Table 6 Marginal effects – Age

		Margin	Std. Err.	z	P>z	[95% Conf.	Interval]
age9c							
2		0.003551	0.000781	4.54	0	0.002019	0.005082
3		0.00249	0.000382	6.52	0	0.001741	0.003239
4		0.002725	0.000386	7.06	0	0.001969	0.003481
5		0.003433	0.000449	7.64	0	0.002553	0.004313
6		0.001383	0.000319	4.33	0	0.000757	0.002008
7		0.001	0.000723	1.38	0.166	-0.000416	0.002417
		dy/dx	Std. Err.	z	P>z	[95% Conf.	Interval]
age9c							
2	3	-0.00106	0.000863	-1.23	0.219	-0.00275	0.00063
	4	-0.00083	0.000872	-0.95	0.344	-0.00253	0.00088
	5	-0.00012	0.000907	-0.13	0.897	-0.0019	0.00166
	6	-0.00217	0.000852	-2.54	0.011	-0.00384	-0.0005
	7	-0.00255	0.001079	-2.36	0.018	-0.00466	-0.00044
3	2	0.00106	0.000863	1.23	0.219	-0.00063	0.00275
	4	0.00024	0.000541	0.43	0.664	-0.00083	0.0013
	5	0.00094	0.000591	1.6	0.111	-0.00022	0.0021
	6	-0.00111	0.000503	-2.2	0.028	-0.00209	-0.00012
	7	-0.00149	0.000828	-1.8	0.072	-0.00311	0.00013
4	2	0.00083	0.000872	0.95	0.344	-0.00088	0.00253
	3	-0.00024	0.000541	-0.43	0.664	-0.0013	0.00083
	5	0.00071	0.000586	1.21	0.227	-0.00044	0.00186
	6	-0.00134	0.000506	-2.65	0.008	-0.00233	-0.00035
	7	-0.00172	0.00083	-2.08	0.038	-0.00335	-0.0001
5	2	0.00012	0.000907	0.13	0.897	-0.00166	0.0019
	3	-0.00094	0.000591	-1.6	0.111	-0.0021	0.00022
	4	-0.00071	0.000586	-1.21	0.227	-0.00186	0.00044
	6	-0.00205	0.000554	-3.7	0	-0.00314	-0.00096
	7	-0.00243	0.00086	-2.83	0.005	-0.00412	-0.00075
6	2	0.00217	0.000852	2.54	0.011	0.0005	0.00384
	3	0.00111	0.000503	2.2	0.028	0.00012	0.00209
	4	0.00134	0.000506	2.65	0.008	0.00035	0.00233
	5	0.00205	0.000554	3.7	0	0.00096	0.00314
	7	-0.00038	0.000777	-0.49	0.622	-0.00191	0.00114
7	2	0.00255	0.001079	2.36	0.018	0.00044	0.00466
	3	0.00149	0.000828	1.8	0.072	-0.00013	0.00311
	4	0.00173	0.00083	2.08	0.038	0.0001	0.00335
	5	0.00243	0.00086	2.83	0.005	0.00075	0.00412
	6	0.00038	0.000777	0.49	0.622	-0.00114	0.00191

Source: Authors based on GEM database

Table 7 Marginal effects – GEMOCCU

		Margin	Std. Err.	z	P>z	[95% Conf.	Interval]
gemoccu							
	1	0.0018613	0.0002224	8.37	0	0.0014253	0.0022972
	2	0.0013721	0.0004865	2.82	0.005	0.0004185	0.0023257
	3	0.0009064	0.0004236	2.14	0.032	0.0000761	0.0017366
	4	0.0005301	0.0005311	1	0.318	-0.0005109	0.001571
	5	0.000251	0.0002547	0.99	0.324	-0.0002482	0.0007501
	6	0.0009456	0.0004224	2.24	0.025	0.0001177	0.0017736
	7	0.0081461	0.0008679	9.39	0	0.0064451	0.0098472
		dy/dx	Std. Err.	z	P>z	[95% Conf.	Interval]
gemoccu							
1	2	-0.0005	0.0005	-0.91	0.363	-0.00154	0.00057
	3	-0.001	0.0005	-1.97	0.049	-0.0019	-0.00001
	4	-0.0013	0.0006	-2.31	0.021	-0.00246	-0.0002
	5	-0.0016	0.0003	-4.71	0	-0.00228	-0.00094
	6	-0.0009	0.0005	-1.92	0.055	-0.00185	0.00002
	7	0.0063	0.0009	7.06	0	0.00454	0.00803
2	1	0.0005	0.0005	0.91	0.363	-0.00056	0.00154
	3	-0.0005	0.0006	-0.72	0.472	-0.00173	0.0008
	4	-0.0008	0.0007	-1.17	0.241	-0.00225	0.00057
	5	-0.0011	0.0005	-2.06	0.04	-0.00219	-0.00005
	6	-0.0004	0.0006	-0.66	0.507	-0.00169	0.00083
	7	0.0068	0.001	6.71	0	0.00479	0.00875
3	1	0.001	0.0005	1.97	0.049	0.00001	0.0019
	2	0.0005	0.0006	0.72	0.472	-0.0008	0.00174
	4	-0.0004	0.0007	-0.55	0.579	-0.00171	0.00095
	5	-0.0007	0.0005	-1.32	0.187	-0.00163	0.00032
	6	0	0.0006	0.07	0.948	-0.00114	0.00122
	7	0.0072	0.001	7.47	0	0.00534	0.00914
4	1	0.0013	0.0006	2.31	0.021	0.0002	0.00246
	2	0.0008	0.0007	1.17	0.241	-0.00057	0.00225
	3	0.0004	0.0007	0.55	0.579	-0.00095	0.00171
	5	-0.0003	0.0006	-0.47	0.636	-0.00144	0.00088
	6	0.0004	0.0007	0.61	0.54	-0.00091	0.00175
	7	0.0076	0.001	7.44	0	0.00561	0.00962
5	1	0.0016	0.0003	4.71	0	0.00094	0.00228
	2	0.0011	0.0005	2.06	0.04	0.00005	0.00219
	3	0.0007	0.0005	1.32	0.187	-0.00032	0.00163
	4	0.0003	0.0006	0.47	0.636	-0.00088	0.00144
	6	0.0007	0.0005	1.41	0.158	-0.00027	0.00166
	7	0.0079	0.0009	8.65	0	0.00611	0.00968
6	1	0.0009	0.0005	1.92	0.055	-0.00002	0.00185
	2	0.0004	0.0006	0.66	0.507	-0.00083	0.00169
	3	0	0.0006	-0.07	0.948	-0.00122	0.00114
	4	-0.0004	0.0007	-0.61	0.54	-0.00174	0.00091
	5	-0.0007	0.0005	-1.41	0.158	-0.00166	0.00027
	7	0.0072	0.001	7.42	0	0.0053	0.0091
7	1	-0.0063	0.0009	-7.06	0	-0.00803	-0.00454
	2	-0.0068	0.001	-6.71	0	-0.00875	-0.00479
	3	-0.0072	0.001	-7.47	0	-0.00914	-0.00534
	4	-0.0076	0.001	-7.44	0	-0.00962	-0.00561
	5	-0.0079	0.0009	-8.65	0	-0.00968	-0.00611
	6	-0.0072	0.001	-7.42	0	-0.0091	-0.0053

Source: Authors based on GEM database

5. DISCUSSION

Based on the obtained results, it is concluded that hypothesis H1 is partially confirmed. Of all the demographic characteristics considered, household size was not statistically significant. The first statistically significant demographic factor is gender. The results showed that men are more likely to deal with logistics than women. This result agrees with previous research (Tsai et al., 2016; Arafat and Saleem, 2017). The very nature of logistics jobs is one of the reasons for this, because they are much more attractive and adequate for members of the male sex, then there are social expectations, and earlier works mention a tendency to risk, which is higher in men (Haus et al., 2013). The next statistically significant factor is age. The categories of 18 to 24 and 45 to 54 years old are most likely to work in logistics. Both categories have a statistically significant difference compared to the categories of the oldest, who are over 55 years old. For the first category, the result is justified by the fact that the probability of starting a new venture is highest in earlier years and that it decreases over the years (Levesque & Minniti, 2006). The conclusion that the younger population is more likely to deal with logistics is confirmed by other works (Tsai et al., 2016; Arenius & Minniti, 2005; Ronstadt, 1983). Another statistically significant category is from 45 to 54, and it was expected, because to perform a significant part of logistics activities, experience, knowledge, financial resources, means of transport and other infrastructure are needed, the acquisition of which takes time (Pindado Tapia & Sánchez García, 2017; Zagata & Sutherland, 2015; Leković & Petrović, 2020). Blanchflower (2004) concludes that an entrepreneur is more likely to be an older person, but an emerging entrepreneur is more likely to be a younger person. The results showed that the self-employed category has the highest probability of engaging in logistics compared to all other categories and that there is a statistically significant difference between this category and all other categories of work status (Carter et al., 2003). This result is completely logical, given that the work analyzes the determinants of early entrepreneurs in the field of logistics.

The second hypothesis was fully confirmed, because the results showed that entrepreneurs in the logistics sector have expectations regarding the growth of the number of employees (≥10 employees or ≥50% of employees). The result is consistent with the findings from the available literature (Tsai et al., 2016; Karadeniz & Özçam, 2010). Survival in this area is not possible for those who stagnate and do not want growth. The competitive struggle of this sector forces all participants to increase the scope of their business. The development of other activities increases the number of transactions, which represents an opportunity for entrepreneurs in the logistics sector. The door to bigger and more lucrative jobs is open only to the big ones and those who develop their business.

The results showed that it is statistically significant and more likely that an entrepreneur in the field of logistics generates over 25% of his income from abroad. Since it is the logistics sector in Europe, such results were expected. Logistics services are essential for international trade, and Europe is known for its strong international trade links. Logistics jobs are often cross-border, so the generation of a significant part of income from abroad is also expected from entrepreneurs who are in the early stages of their ventures (Ajzen, 1991; Alves et al., 2017). This concludes the confirmation of the third hypothesis.

ly stages of their ventures (Ajzen, 1991; Alves et al., 2017). This concludes the confirmation of the third hypothesis.

The study considered the role of motivation in choosing an entrepreneurial career in the logistics sector. The findings show that logistics entrepreneurs are not motivated by the need

to create change in the world. Logistics itself is an operationally supported activity, which should deliver, store, and enable the use of products and services. This makes it clear that there is not much room for making revolutionary changes, so entrepreneurs are not expected to be motivated by making changes. This motive is characteristic of many entrepreneurs (Deakins & Whittam, 2000), but not for those coming from the logistics sector.

The next statistically significant motivational factor is an increase in total income and wealth (Morris et al., 2006; Cassar, 2007). The results show that with the growth of motivation to increase income and wealth, the probability of engaging in entrepreneurship in the logistics sector also increases. The same situation applies to the last statistically significant factor of motivation, which is a living wage due to lack of work, which is a necessity factor (Morris et al., 2006; Hessels et al., 2008). We can conclude that entrepreneurs in the logistics sector are driven by financial motivators and that money drives them best. The motivation to engage in entrepreneurship due to the continuation of the family tradition is not a statistically significant factor. The reason for this is that the subjects of the study are budding entrepreneurs, whose venture is in the incubation phase. This means that they had no one to inherit the business from. Everything leads to the conclusion that the fourth hypothesis H4 is partially confirmed.

6. CONCLUSION

The development of logistics makes it possible to speed up the optimization and adjustment of the industrial structure, the realization of economic growth, and therefore faster economic development. Entrepreneurship and innovation are tools that enable the development of logistics. Looking at the determinants of entrepreneurs in the field of logistics is a necessity, to get to the source of entrepreneurial ventures in this field, which can have multiple significance. This was the goal of our research, for which the Global Entrepreneurship Monitor (GEM) database from 2019 was used. Within it, the responses of entrepreneurs in the early stages of the development of their ventures were filtered, of which 192 werethose dealing with logistics.

Four groups of determinants were used to analyse entrepreneurs in the field of logistics. Demographic factors make up the first group. In terms of gender, it is more likely that an entrepreneur in the logistics sector is male. From the aspect of age, the categories from 18 to 24 and from 45 to 54 years have the highest probability of engaging in entrepreneurship in the field of logistics. Regarding work status, entrepreneurs in the logistics sector are most likely to be self-employed. Further analysis showed that entrepreneurs from the logistics sector are focused on the growth of their business. In addition, the results testify that this category of entrepreneurs is oriented towards the internationalization of business. In the case of motivation, it was found that financial motivators drive entrepreneurs in the logistics sector. When it comes to starting ventures inspired by the desire to make a difference in the world, the results show that entrepreneurs in the logistics sector do not start ventures with the motivation to bring about change in the world.

The work contributes to the increase of literature in the field of logistics and entrepreneurship. It provides a base for further research in this area. It highlights the key determinants of entrepreneurs in the field of logistics, which makes policymakers aware of where they should look for the source of motivation for ventures in this field, when

they want to stimulate or reduce them. The involvement of entrepreneurs in the logistics sector can bring multiple benefits. Entrepreneurs should bring with them flexibility and innovation. In this way, it contributes to the optimization of activities in the logistics system, within which there is a large interdependence of elements, which provides many opportunities for improvements. That is why the logistics system is the right place to use the entrepreneurial potential.

The paper contains several limitations. The title of the paper says that the determinants of entrepreneurs in the field of logistics in Europe are investigated. However, the GEM database does not cover all European countries, as some countries do not have a GEM national team that conducts and finances these studies. The results database is from 2019, which does not mean that there are no current results, but it does not guarantee them. The answers of entrepreneurs from the logistics sector were filtered from the database, which means that the questionnaire was not created specifically for this research. A more detailed questionnaire would perhaps give more detailed results, include another determinant, and give a better picture of entrepreneurs from the logistics sector. The database includes 73,806 respondents, of which only 192 are from the logistics sector, which represents another limitation. The consulted literature on the motivation of entrepreneurs did not include only entrepreneurs from the logistics sector, but mostly entrepreneurs coming from different sectors. The reason for this was the lack of literature for a specific topic.

Further research could lead to the creation of a questionnaire that is specifically designed to determine the determinants of entrepreneurs in the field of logistics. The analysis of the determinants could be carried out by year and thus give a temporal overview and make comparisons. The inclusion of other determinants could lead to new conclusions. In addition, seeking concrete recommendations for improvements from logistics entrepreneurs could have multiple benefits for many stakeholders.

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DETERMINANTE PREDUZETNIKA U SEKTORU LOGISTIKE: REZULTATI ANALIZE GEM ISTRAŽIVANJA

Predmet analize ovog rada su determinante preduzetnika u ranim fazama razvoja svojih poduhvata, koji se bave logistikom u Evropi. Cilj je da se identifikuju faktori koji utiču na odluku o bavljenju preduzetničkom delatnošću u sektoru logistike.. Za analizu je korišćena Global Entrepreneurship Monitor (GEM) baza podataka iz koje je filtrirano 73 806 ispitanika iz zemalja Evrope, od kojih je 192 iz sfere logistike. Statistička analiza je odrađena putem softverskog paketa za statističku analizu Stata IC 15.0. Istraživanjem su obuhvaćeni demografski faktori, faktori rasta, faktori internacionalizacije i motivacioni faktori. Demografski faktori (pol, starost, radni status) su statistički značajni za preduzetnike u oblasti logistike. Za muškarce je veća verovatnoća da budu preduzetnici u sektoru logistike. Starosne kategorije od 18 do 25 i od 45 do 54 imaju najveću verovatnoću da se bave ovim poduhvatima. Samozaposlen je dominantan radni status ovih preduzetnika. Preduzetnike u sferi logistike karakteriše očekivanje u pogledu rasta broja zaposlenih, kao i značajan procenat ostvarenog prihoda iz inostranstva. Finansijski motivatori su ti koji pokreću preduzetnike u sektoru logistike.

Ključne reči: *Logistika, preduzetništvo, rast, internacionalizacija, motivacija*.