Iniciativa empresarial en la tercera edad: datos de países para el 2017-2018.

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RESUMEN: El objetivo del estudio es evaluar los indicadores que describen la proporción de emprendedores tempranos que pertenecen a la tercera edad en la población total de este grupo de edad. La evaluación se realizó utilizando modelos matemáticos que representan las funciones de densidad de la distribución normal. Los resultados de las encuestas realizadas en el proceso de monitoreo del emprendimiento global se utilizaron como datos iniciales. El estudio permitió determinar países que se caracterizan por valores altos y bajos de indicadores. El enfoque metodológico y las herramientas para evaluar la actividad empresarial temprana propuesta en el artículo se pueden utilizar en la investigación sobre emprendimiento en la tercera edad.

PALABRAS CLAVES: emprendimiento, actividad emprendedora temprana, tercera edad, países, monitoreo global del emprendimiento.

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ABSTRACT: The aim of the study is to assess the indicators describing the proportion of early entrepreneurs belonging to the third age in the total population of this age group. The assessment was carried out using mathematical models representing the density functions of the normal distribution. The results of surveys conducted in the process of Global entrepreneurship monitoring were used as initial data. The study allowed to determine countries that are characterized by high and low values of indicators. The methodological approach and the tools for assessing early entrepreneurial activity proposed in the article can be used in research on entrepreneurship in the third age.

KEY WORDS: entrepreneurship, early entrepreneurial activity, third age, countries, global monitoring of entrepreneurship.

INTRODUCTION.

The third age comes when the first age (childhood, youth, study) and the second age (active work, parenting) ends. The onset of the third age in most studies ranges from 50 to 60 years (Gimmon, Yitshaki, & Hantman, 2018; Kibler et al., 2012). According to scientists, the third age in economically developed countries often lasts from 10 to 30 years. It is a part of person`s life when he or she is able to fully solve the tasks set before them and independently meet their diverse social,
psychological, personal and economic needs. In the vast majority of countries, advances in medicine, reduction of child mortality, improving nutrition and living conditions of people result in population aging and increase in the proportion of people of pre-retirement and retirement age. Therefore, there is an increasing interest in the problems of workers of the third age.

Previous research suggests that there are significant prospects for such people to continue their working careers by encouraging them to start their own business, that is, to become entrepreneurs (Kautonen, Down & South, 2008; Webster, Walker & Turner, 2005; Kautonen, Down, & Minniti, 2013).

The authors of the article (Singh & De Noble, 2003) made an assumption that the beginning of entrepreneurial activity in the third age, can delay the onset of the fourth age (weakness and death). For senior age categories, entrepreneurship is a good alternative to hired labor.

The third-aged people are increasingly seeking for sustainable career options paying special attention to interesting long-term jobs. At the same time, they can change their place of work, as well as move from paid employment to entrepreneurship. Thus, entrepreneurship is among the favorable options offered for the third age group. The ever-changing economic environment provides a continuous stream of potential opportunities for people who can recognize profitable ideas. At the same time, people should prepare in advance for age-related changes and new activities to ensure a sense of satisfaction with their lives.

The third-age entrepreneurs have specific characteristics, face different challenges, and require the support that is different from the younger-age entrepreneurs (Gielpnik, Zacher & Wang, 2018). That is why the development of measures to support and assist such entrepreneurs requires a better understanding of the phenomenon of third-age entrepreneurship, including the perception and attitudes of entrepreneurs themselves.
The purpose of the study with the presented results is to analyze the features, patterns and trends that characterize the early entrepreneurship of people belonging to the third age, focusing on advantages and disadvantages of early entrepreneurship of the third age and assessment of the current level of this type of entrepreneurship. In this article, the term “early entrepreneurship” refers to the activities of people who are actively involved in creating their own business or have already established it and have been working for less than 3.5 years. This concerns both owners of enterprises and individual entrepreneurs.

The sources note a number of potential social and economic benefits from encouraging self-employment of people in the third age (Kautonen, 2008). In addition, the paper (Botham & Graves, 2009) argues that third-age entrepreneurship can increase the innovation potential of an economy by realizing the human and social capital of mature people.

The increase in the number of people over the age of 50 indicates that a greater number of them will be able to participate in business activities in the future. Entrepreneurship among such people may allow them to stay in the workforce for longer, thereby alleviating financial pressures and providing an alternative opportunity to continue earning income (Kibler et al, 2012). In addition, it is argued that entrepreneurship compared to employment can provide greater motivation for people to stay in the labor market because it can provide them with greater flexibility, control, and freedom (Zhang, 2008). People on the verge of retirement may see small-scale entrepreneurship as a positive way to keep active lifestyle, thereby increasing their social integration. The role of entrepreneurship at the end of the workers career in reducing unemployment in the third age, increasing social integration of such people and ensuring economic growth through using human and social capital by the third-age citizens is described in the work by Botham & Graves (2009).
In the paper (Kautonen, van Gelderen & Tornikoski, 2011), it was suggested that due to the increase in life expectancy of people, a significant number of new businesses will be created by entrepreneurs belonging to the third age. This assumption was confirmed in the United States, where the proportion of entrepreneurs aged 55 to 64 years among all entrepreneurs (aged 20 to 64 years) increased from 23.9% in 1996 to 27.7% in 2011 (Fairlie, 2014). This trend is due to increase in life expectancy, as well as the fact that many people of this age feel able to start a fundamentally new activity.

DEVELOPMENT.

Methodology and data.

The given research is devoted to the analysis of the features of early entrepreneurial activity in the third age. The study was conducted in two phases. At the first stage, we considered the advantages and disadvantages of early entrepreneurship of the third age. At the second stage, we assessed the levels of early entrepreneurial activity in modern national economies.

Data from surveys conducted during the implementation of Global entrepreneurship monitoring projects (Global Entrepreneurship Monitor, 2018; Global Entrepreneurship Monitor, 2019) were also used. The Global monitoring involved a wide range of indicators, including early business activity data for 54 countries in 2017 and 48 countries in 2018. Thus, the sample of countries considered in these projects is more than a quarter of the total number of independent countries. Early entrepreneurial activity at the age of 65 and older is very small as shown in studies (Azoulay et al., 2018; Bates, 1995). Therefore, the Global monitoring projects provide data on early entrepreneurs of the third age, ranging from 55 to 64 years. Accordingly, our study assessed the indicators of early entrepreneurship for this age group. We considered as indicators the proportion of early entrepreneurs aged 55 to 64 years in the total adult population of this age.
The earlier studies reviewed above allowed to put forward two hypotheses, which were tested during the second stage of the study:

- hypothesis 1 - currently, the values of early entrepreneurial activity of the third generation have a significant variation across countries;
- hypothesis 2 - there are no significant time shifts in the average values of the proportion of early entrepreneurs in the total adult population in the countries under consideration, as well as the interval of change of this indicator in most countries.

The first hypothesis was tested using mathematical models representing the density functions of the normal distribution. The development of these functions, as shown by the previous work of the authors, allows to obtain unbiased characteristics of the studied economic processes. The methodology of using the density functions of the normal distribution for the estimation of specific indicators is given in the articles (Pinkovetskaia, 2015; Pinkovetskaia et al., 2019). The second hypothesis was tested by comparing data for 2018 and 2017.

**Theoretical foundations of entrepreneurship in the third age.**

In previous studies (Kibler et al., 2015; Radford, Shacklock & Meissner, 2015) the factors that distinguish third-age first-time entrepreneurs from younger colleagues have been established. These factors include:

- Long-term development of skills and competencies.
- Work and life experience, maturity and wisdom.
- Availability of financial and other resources.
- Availability of contacts and social networks.
- Certain age-related health problems.
- Reducing the time that can be devoted to work, including the duties of caring for relatives.
- The need to overcome age prejudices.
The entrepreneurial climate also has an impact on the level of entrepreneurship development in the third age, since it is not enough to create a valid business plan for the success of a new enterprise. It is important for business to be publicly recognized and supported; for example, the authors (Walker & Webster, 2007) concluded that the development of entrepreneurship in later life requires government policies that prevent potential discrimination based on the age of entrepreneurs.

There are several distinct advantages of early entrepreneurship in the third age:

- The growth of the number of such entrepreneurs can solve fiscal problems by increasing the tax base.
- Using the experience gained by these entrepreneurs over a long working life, which would have been lost if it had not been reinvested in the economy.
- Providing additional income to those people who have not been able to create a pension that meets their needs.
- Flexible alternative to employment to ensure an attractive work-life balance.
- Positive way to maintain their activity and increase their integration into society.

Let us consider in more detail the potential benefits of entrepreneurship for the people of the third age. Current knowledge of such entrepreneurship suggests that age in many cases is a driving force in the creation and maintenance of successful enterprises, as well as that citizens of the third age are more capable of starting and running a business than those who are younger. Unlike young entrepreneurs, such people tend to have more work experience, through which they can develop more complex technological and technical projects that require deep knowledge in the industry. The large professional capital accumulated during their working career can be used in their own business. In addition, the contacts acquired from previous jobs can help in mobilizing resources, gaining support, and establishing viable business relationships.
Technical and managerial skills, as well as industry knowledge gained during career growth, can help entrepreneurs to work successfully; for example, managerial experience can help avoid the pitfalls of the less experience business launchers. Many people need more flexibility in their work schedules and freedom than wage labor can offer. Flexibility is of particular importance for some people who have to care for elderly, sick relatives and provide care for grandchildren (Cressy & Storey, 1995). Entrepreneurship provides flexibility in work allowing them to perform such duties. The ability to find a balance between work and other responsibilities can be an important factor for workers remaining in the labor market.

It should be noted that the survival rates of enterprises created by entrepreneurs of the third age are higher than those of young entrepreneurs (Cressy & Storey, 1995). Such entrepreneurs are reported to be more risk-averse and have shorter time horizons in starting a business compared to younger people (Botham & Graves, 2009). The risk of starting a business for the third-age citizens is objectively higher. Consequently, if the business fails, they have less time to make up for the losses and create an alternative source of income. Therefore, they should expect to create enterprises with sufficiently high profitability.

According to the research (Wainwright et al., 2011), the barriers to the third-age entrepreneurs include:

- Reduced learning abilities.
- Low adaptation to frequent changes in the environment.
- Deterioration of the state of health.
- Difficulties in obtaining start-up grants.
- Lack of education that meets modern requirements.
The successful early entrepreneurship is limited by age prejudices and negative stereotypes. A characteristic feature of such stereotypes is that they can lead to age-typing of economic activities that are designated as appropriate for such people. According to the work (Kautonen, van Gelderen & Tornikoski, 2011), this type of cultural ageism can significantly undermine the attitude of the third-age people to starting a business.

According to the authors of the work, it is necessary to overcome negative stereotype approval from the family and friends of the entrepreneur. It is they who are closest to the person and are most able to influence his attitude to entrepreneurship. In addition, it is important for the person to be assured of their abilities and skills as an entrepreneur. The study (Kautonen, 2012) argues that a strong assurance in one's own self-efficacy is able to reduce the risks associated with starting a business in the third age.

According to the study (Stamov-Roßnagel & Biemann, 2012; Loretto, 2010), age is positively associated with the intention of a person to create their enterprise on the basis of motivation for activities related to generativity, that is, the ability to generate and create. The early third-age entrepreneurs may be motivated by a desire to fulfill their perspectives and a substantial need for self-realization, especially as they have more opportunities to pursue intentions that they could not realize in the early stages of their lives.

Thus, people of the third age tend to have more experience, financial and other resources that help them turn their intentions into entrepreneurial activities in a relatively short time. In general, the third age of a person is negatively associated with the prospect of future entrepreneurship, but is positively associated with the possibility of existing implementing entrepreneurial intentions.

In the context of the early third-age entrepreneurship, support from family and friends is important (Wainwright, Kibler, Blackburn & Kautonen, 2011). The more such support is expressed, the higher is the person's intention to develop and create their own business. In addition, when family
members and friends positively perceive entrepreneurial actions and provide assistance, it is easier to carry out this activity. This is especially true for those people who conducted business independently and had a positive experience. They are able to provide start-up entrepreneurs of the third age with both emotional support and professional advice. Conversely, family members with experience in large organizations, including the public sector, possess a different work experience and a different set of social norms and expectations. As a result, they often negatively evaluate the activities of the third-age entrepreneurs. This can discourage start-up entrepreneurs and morally suppress their desire to create their own business.

Guided by economic and social policy considerations, governments in the developed countries encourage the third-age workers to stay in the labor market longer and postpone retirement. Entrepreneurship of the third age is a good way to solve this problem, so in these countries, measures of stimulating such entrepreneurs are being implemented. One of such measures is the development of special training programs to stimulate early entrepreneurship in the third age. Thus, many economically developed countries implement the state policy on teaching entrepreneurial competencies to elderly people. Training programs also include business counseling, mentoring and personal coaching. Participation in such programs can extend people's entrepreneurial motivation, knowledge of new business opportunities in market conditions, and increase participants' sense of self-efficacy.

**Results of the calculation experiment.**

The study has already been noted to include the construction of mathematical models describing the distribution of the considered indicators in countries. The models were based on the information collected from surveys conducted by the global enterprise monitoring project in 2017 and 2018. We used density functions of the normal distribution as models. Such functions ($y$), describing the
The proportion of entrepreneurs belonging to the above age group \((x, \%)\) in the total population of this age group, are given below.

According to the data for 2017:

\[
y_1(x_1) = \frac{252.0}{4.9 \times \sqrt{2\pi}} \cdot e^{-\frac{(x_1-7.7)^2}{2\times4.9\times4.9}}.
\]  

(1)

According to the data for 2018:

\[
y_2(x_2) = \frac{176.0}{5.1 \times \sqrt{2\pi}} \cdot e^{-\frac{(x_2-7.6)^2}{2\times5.1\times5.1}}.
\]  

(2)

The quality of the developed models was assessed by using three tests. The calculation experiment showed that the calculated statistics values on the Kolmogorov-Smirnov test are located in the range from 0.064 to 0.102. These values are significantly smaller than the table value of 0.152 (significance level 0.05). The calculated values on the Pearson test are from 0.166 to 4.720, less than the table value (9.490). The calculated values of the statistics on the Shapiro-Vilk test exceed the table value 0.93 (significance level 0.01). Econometric analysis of these 3 tests showed the high quality of each of the functions (1) and (2).

Using the density functions of the normal distribution, the indicators were obtained characterizing the levels of early entrepreneurial activity in the economies of the countries under consideration. These indicators are the average values of the early entrepreneurs` proportion in the total population of the age group from 55 to 64 years, as well as the intervals of changes in the values of the proportion of early entrepreneurs in most (68%) countries. The average values correspond to such parameters of the normal distribution functions (1) and (2) as the mathematical expectation (median). Intervals are calculated according to these averages and standard deviations. In this case, to calculate the boundaries of the interval to the average value of the indicator, respectively, the
specified deviation is added and subtracted. These indicators, determined by the parameters of functions (1) and (2), are shown in table 1. The averages are given in column 2, and column 3 of this table shows the above intervals.

Table 1. Indicators describing levels of early entrepreneurial activity, %.

<table>
<thead>
<tr>
<th>Years</th>
<th>Average value</th>
<th>Interval of change of values of indicators for most countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2017</td>
<td>7.7</td>
<td>2.8-12.6</td>
</tr>
<tr>
<td>2018</td>
<td>7.6</td>
<td>2.5-12.7</td>
</tr>
</tbody>
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The information, listed in column 2 of table 1 shows, that the average value of the proportion of entrepreneurs who started out between the ages of 55 and 64 for the countries in 2018 was 7.6%. Values of this indicator typical for most (68%) countries as seen in column 3 varied in a wide range (from 2.5% to 12.7%). The level of the indicator above the upper limit of the interval given in column 3 of table 1 occurred in 2018 in such countries as Guatemala, Thailand, Sudan, Lebanon, Peru, Chile, Angola. The values under the lower limit of the interval were observed in Russia, Italy, Poland, Croatia, Bulgaria, Germany.

In 2017, the average proportion of the early entrepreneurs aged 55 to 64 years in the countries under consideration was 7.7%. Changes of this indicator, typical for most countries, also varied in a wide range. The level of this indicator (higher than the upper limit of the interval given in column 3 of table 1) was observed in 2018 in such countries as Slovakia, Guatemala, South Korea, Vietnam, Thailand, Lebanon, Peru, Chile. Low values were observed in Bulgaria, France, Japan, Taiwan, Germany, Slovenia.
Early entrepreneurs proportion values higher than the upper limit of the interval were observed mostly in the middle-and low-income countries in 2018 and 2017. The values smaller than the lower limit of the interval were typical for high-income countries, only Bulgaria and Russia had an average income level.

The calculations made it possible to conclude that early entrepreneurial activity in the third age has received a significant development in most countries. On average, in countries included in the Global monitoring of entrepreneurship one in thirteen residents between the ages of 55 and 64 was an aspiring entrepreneur. Data analysis given in column 3 of the table showed that hypothesis 1 about significant differentiation of values of early entrepreneurial activity in different countries has been confirmed.

The comparison of the average values of early entrepreneurial activity indicators for 2018 and 2017 as well as intervals of change of indicators on the majority of the countries shows their similarity. Thus, it can be concluded that there are no significant time shifts in the average values of the proportion of early entrepreneurs in the total adult population in the countries under consideration as well as the interval of change of these values typical for most countries. That is, hypothesis 2 about the absence of significant time shifts of these indicators for 2017-2018 has been confirmed.

**CONCLUSIONS.**

In general, the study possesses a certain originality and novelty. It contributes to the understanding of the current patterns of early entrepreneurial activity in the age group from 55 to 64 years.

Economic and mathematical modelling of empirical data with the use of normal distribution functions was carried out to provide unbiased estimates of the average values and intervals of change in early entrepreneurial activity in the countries under consideration.
The results of the research, which have scientific novelty, are as follows:

- Assessment of the developed values of proportion indicators of early entrepreneurs of the third age with the use of normal distribution functions has been carried out.

- High quality approximation of empirical data using normal distribution functions has been proved.

- Average proportion values of the early entrepreneurs in the age group from 55 to 64 years in the countries included in the global monitoring of entrepreneurship for 2017 and 2018 have been determined.

- Range of changes in the proportion of start-up entrepreneurs in the total population, typical for most countries, has been determined.

- It has been shown that early entrepreneurial activity in the third age has received significant development in most countries.

- Significant differentiation of the share of start-up entrepreneurs in the total population of the countries has been proved.

- Countries with high and low levels of early entrepreneurial activity have been identified.

- Absence of time shifts of average values of specific weights of early entrepreneurs in the total adult population for the period from 2017 to 2018 has been proved.

The methodological approach proposed in the article and tools for assessing early entrepreneurial activity can be used in research on entrepreneurship in the third age, as well as in the justification of the relevant programs and plans for its development at the federal, regional and municipal levels.

The practical significance of the research is associated with the use of the information obtained in the activities of the authorities and the business sector of the national economy.

The results obtained can be used by public authorities to develop a policy for the development of entrepreneurship based on the existing age structure of the population, including assistance to the senior category of start-up entrepreneurs on the basis of grants, subsidies, reduction of interest on
loans. The information about the factors influencing the opportunity of creating own business can be interesting for beginning entrepreneurs of the third age.

The new knowledge obtained can be used in higher and secondary educational institutions, as well as in the qualification improvement for government departments workers that are connected with the regulation of entrepreneurship in any country.

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