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Contributing to the Delinquency of a Minor as a Violation of Albanian Criminal Code

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Abstract

Forcing a minor to commit a criminal offense is considered a crime in the Republic of Albania and is punishable. Regardless of whether or not the instigator participated in the criminal act, this crime figure is referred to as formal and does not necessarily require consequence under current laws. The future of Albania, as well as of any country, is closely related to the life development that every young person experience from his first steps until reaching adulthood. From a subjective standpoint, such a negative impact on a juvenile, such as incitement to commit a criminal action, may lead to a tendency to adult criminality, making the study of this topic and future court judgment essential. According to the Criminal Code of the Republic of Albania, the incitement of juveniles to crime occurs at two different points. The first expresses the punishment that will be imposed on the instigator in committing this criminal offense, and the second expresses the minimum age limit for who will be considered the juvenile instigated in committing this crime. The Criminal Code defines incitement of juveniles to crime shortly, leaving room for interpretation and leaving doubt as to whether the sentence or age limit set is fair.

When we compare the psychological and legal aspects of this criminal offense, the question of whether the punishment determined by the legislator is proportionate to the danger of the criminal offense arises. The main focus will be on Article 129 of the Criminal Code of the Republic of Albania, which will be examined separately due to the age limit of "under 14 years old."

Keywords: Juvenile Delinquency, Criminal Code, Crime, Instigation.

1. Introduction

It would be hard to form a consistent analysis of juvenile delinquency. The study and monitoring of cases would only provide access to a variety of components, including not only criminal and criminal procedural law, but also family law (in cases where the juvenile's guardian is the instigator), labor code (in cases where the relationship between the employer and the juvenile employee is affected), and so on. The importance of juvenile delinquency from a social perspective is always crucial in any analysis and monitoring done. Albania's future, like the ultimate fate of every country, is inextricably linked to the life development that every young person goes through from his or her first steps to adulthood. This is a development that is plainly influenced by family and social factors. Another very important factor of this well-being is also attributed to the state. This is because it is important to remember that young people are the ones who shape the future of this country, and any positive or negative impact on their lives will be felt very soon. Although such an examination may appear to be psychological, these are the subjective factors that are inexorably tied to any applicable law. Law and its implementation have been largely dismissed as irrelevant topics for inquiry into the "causes" of delinquency, that's why the social criteria it's essential.[1]

A minor is defined as a person who has not yet reached the age of maturity (18 years) and thus has a special status under the law. We say special because, despite other differences, juveniles face a different punishment than adults in the criminal justice system. This was deemed a right due to the maturity of a minor's knowledge of his or her actions or omissions until the consequences arrived. We frequently hear examples of minors being manipulated to commit various criminal activities in the written and visual media. The news that a juvenile had been incited to steal by a police officer was first reported in the media in February of this year. While according to the Albanian legislation, if the violation of public order and safety has come as a result of the actions of a minor under 14 years old, the police officer takes measures to stop the illegal actions and notifies the parent or guardian of the minor, and in the above case is the officer the one that leads him to the crime.[2] Such tragic incidents make you think about how important it is to safeguard these minors and to be aware of the potentially catastrophic consequences for any society. Due to the nature of this crime, the fact that such individuals can be convicted and suffer additional penalties in addition to the main penalty is insufficient. Complementary punishments are the types of punishments that are applied when the court deems that the nature of the offense, the personality of the guilty party and other circumstances of the case require the strengthening of the effect of the punishment, its supplementation with another coercive measure.[3] To make a decision on this matter, a thorough examination of the Criminal Code's articles is required.

[1] A. M. Platt "The Child Savers / The Invention of Delinquency" The University of Chicago Press, 1972, p. 13.
[2] LAW Nr. 108/2014 FOR THE STATE POLICE of ALBANIA, Article 101/2.
[3] Sh. Muçi, "E drejta penale, pjesa e përgjithshme", Tiranë 2017, p. 285.

In the history of Albanian criminal law, juveniles have been treated differently from adults. If we take a historical comparative look, in the Albanian criminal legislation before 1944 adapted to the Ottoman criminal law, the age of criminal responsibility was 13 years.[4] The Criminal Code of 1952 provided for the age of criminal responsibility in addition to the age of 14 and the age of 12.[5] The 1995 Criminal Code is what applies today in relation to criminal liability.

2. Maximum sentence limit for inciting juveniles to crime

"Inducing or encouraging minors under the age of 14 to commit a crime is punishable by up to five years in prison," - states the Criminal Code of the Republic of Albania in article 129.

A person who has attained the age of criminal responsibility and is responsible for encouraging, assisting, advising, instructing, etc., with full knowledge of a juvenile instigation, is criminally responsible for this criminal act. It will be considered as such at the very moment when it will be proven that the minor has been pushed to commit a crime. Which determines that it does not matter the arrival of the consequences but whether this inducing can be proven or not. The subject of this crime can be any person who has reached the age of criminal responsibility and induces a minor under the age of 14 to commit a crime.[6]

The instigator's criminal act in this case has two sides to it, as we have "inducing" and "encouraging". The Supreme Court of Albania in his unified decision has reviewed Article 129 of the Criminal Code, which affects the part of collaboration as a criminal violation, in order to unify case law. If it is proven that the minor committed a crime as a result of incitement by a person with criminal responsibility, the abuser will be found responsible under Article 129 of the Criminal Code and if it is proven that the minor was encouraged in order to commit a crime, the offender will be held responsible for both the crime committed in collaboration and the criminal offense under Article 129 of the Criminal Code.[7] He will be held liable under Article 129 of the Criminal Code of Albania and can be sentenced to up to 5 years in prison.

When we evaluate the psychological and legal aspects of this criminal offense, the question of whether the punishment defined by the legislator is proportionate to the danger of the criminal offense arises. Of course, due to the sensitive nature of the issue, and perceptions may diverge, but if we recall what we stated at the beginning of this paper, that the factors influencing young people are directly related to the fate of our society, then the idea can be created that heavier measures should be applied. Seen from a subjective point of view, such a negative impact on a minor, such as incitement to a criminal offense, may lead to a predisposition to adult delinquency, gives importance to the review of this article and then the sentencing by the court. The juvenile used as an instrument for committing a criminal offense in this case is irresponsible due to lack of understanding of the criminal activity and the criminal result that may come from this offense.

3. Minimum and maximum age limit for minors

As in any legislation, there is a set limit to who will be the minimum and maximum age of responsibility or the age limit for as a minor. The Criminal Code of the Republic of Albania has defined for different criminal situations, different age limits for juvenile victims. From Article 129 of the Criminal Code, we conclude that the legislator has set as a limit for determining the incitement of juveniles in crime, juveniles under 14 years of age. The only point in which the incitement of juveniles to a criminal offense is mentioned is precisely this article, which brings the need for a deeper consideration of such cases. The fact that the minimum age for criminal responsibility is 14 years old makes it perhaps more difficult to determine the "induce" in the concrete criminal aspect, even though the legislator is satisfied only with the age criterion. The established age limit sets a negative precedent for those cases which relate to the exploitation of minors who have reached the age of 14 years. The revision of the minimum age limit for this criminal offense would be necessary as long as persons aged 14-18 are still considered minors under criminal law.

The Juvenile Criminal Justice Code defines the rights and duties of a juvenile victim or witness, but does not specify any case of incitement of a juvenile to commit a crime. In JCJC, it says that the minimum age of criminal responsibility is the age of 14 in cases of committing a crime and age 16 in the case of committing a criminal offense provided by the Criminal Code.[8] In an approach to the Criminal Code, they would create a clearer and safer habitat for juveniles who have not reached the age of 18 at the time of the commission of the criminal offense. The situation changes at the moment we are dealing with the criminal offense of encouraging by an adult. The punishment of the adult who commits this criminal offense is determined, the minimum age when this offense is punishable is also determined. Would be the definition of Article 129 of the Criminal Code, however, sufficient? The result from this scientific paper is that, no, the specification made in Article 129 is not sufficient.

If the minimum age limit only for cases of inducing and encouraging to crime was raised to the age of 16, it would bring significant changes in other legal aspects, especially that of employment. This is because juveniles under the age of 18, who have the right to

[4] V. Hysi, "Penologjia", Tiranë 2015, p.335.
[5] Kodi Penal i Shqipërisë 1952, Article 6.
[6] I. Elezi, "E drejta penale, pjesa e posaçme", Tiranë 2016, p.175.
[7] Unifying decision Nr.4, date 15.04.2011 of Supreme Court of Albania.
[8] Statute Nr. 37/2017, The Juvenile Criminal Justice Code

work in light work, up to 6 hours a day, are at greater predisposition for contact and exploitation towards incitement to crime.[9] The difficulty our system might encounter would be in identifying these cases, whether or not we are dealing with incitement to crime. This is because, in this case, we are dealing with legal jobs, but the purpose of employing minors might be illegal. However, due to the complexity and nature of criminal offenses, the role of legislation and jurisprudence is particularly important in the development of criminal law.

Albania is a member of the International Labor Organization, which was founded in 1919 as part of the Treaty of Versailles to demonstrate that universal and lasting peace can only be achieved through social justice.[10] As part of ILO, it can incorporate into its system international conventions which regulate specific issues of labor law. If the revision of the CCA were to take place for the age limit of 16 years, Albania would need strategic policies regarding labor relations with minors, recognition and ratification of many international conventions. Mentioned here, Worst Forms of Child Labour Convention, 1999 (No. 182) for the elimination of the worst forms of child labour, on the worst forms of exploitation of child labor, translated as a kind of incitement to crime. This Convention clearly defines who will be considered the worst forms of child labor, including: all forms of forced labor similar to slavery; forced recruitment of children in armed conflict; use of minors for illegal activities, especially for the production and trafficking of narcotics; jobs that harm the health, safety or morals of minors, etc.[11]

Although the Criminal Code envisages some of these forms of work and sees them as a separate criminal offense, such as the use of prostitution when committed with minors, there is a need to revise Article 129 to better determine where it will extend and what will be the minimum age of application. More specifically, it is Article 124 of the Criminal Code which stipulates that inciting or using minors to work, to provide income, or to perform actions that harm their mental and physical development is punishable in Republic of Albania by imprisonment from 2 to 5 years. Again, we see that the punishment set by the legislator is not sufficient for the weight that this criminal offense has in society, and does not clearly define that it can be specifically incitement to work in an illegal job, considered by this, a crime. In this case, the minor's obligation to provide income can occur in construction, on the road, in factories, mineral mining, agricultural sectors, and so on, work that cannot be performed by minors but does not affect the legality of the work performed.[12]

Moreover, these articles, applicable separately, have defined only the term "juvenile" or "child", which leaves room for interpretation for incitement according to criminal liability starting from the age of 14, or according to Article 129 under 14 years. Changes in the legislation around the age limit and the ratification of a Convention that clearly defines the nature of work to be monitored to avoid incitement to crime, would bring about a revolution in the application of criminal sanctions. As it would be the Criminal Code itself, or the creation of a special law which would define the forms of control and the relevant sanctions.

Most of the other risk factors and indicators of child delinquency differ from those of older juvenile delinquency. Individual and family factors are more likely to be risk factors for inconveniencing at a young age. The array of risk factors for child delinquency expands as children grow older, attend school, and become integrated into their community, which is why an information section in schools about inducing or encouraging juveniles is required. It is critical that educational institutions and others take steps to work more closely with minors and assist those minors who exhibit problematic behaviors. Also, pedagogical staff and the institution's psychologist need to assist in terms of education, awareness, and informing them about prevention forms of inducing or encouraging behavior from an adult.

4. Conclusions

Pushing a minor to participate in a criminal offense as a crime figure, according to current legislation, is referred to it as formal and does not require consequences. Any other interpretation of the Criminal Code provisions for inciting minor to crime would be incorrect and harmful, as it would prolong the proceedings and create an atmosphere of uncertainty about this criminal offense. As a result, a broader analysis and review of the relevant Code provisions is required, addressing both the instigator and the minor victim. If the punishment for these offenses was more severe for the instigator, there would be fewer such cases because the possibility of manipulating young people as just a "easier opportunity" due to their vulnerability would be eliminated. It is not only the life and the future of a minor that is in danger, but of an entire society.
What must be done is as follows:

- Start concentrating on juvenile delinquency as a research topic important for improving educational and, especially, legal standards.
- Sections of information about the criminal offense of inciting juveniles to commit crimes, for the age groups of juveniles from first grade to those who have reached the age of high school, in accordance with their understanding, where the assistance of a psychologist would undoubtedly be required, to determine the amount of information they should receive. Support for prevention and early intervention is absolutely needed. Awareness should occur not only for minors, but also

[9] Article 78/3, Labour Code of Albania.
[10] International Organizations- "International Labour Organization", Ministry for Europe and Foreign Affairs, Albania. Website: https://punetejashtme.gov.al/en/international-organizations/
[11] Article 3, Worst Forms of Child Labour Convention, 1999 (No. 182)
[12] I. Elezi, "E drejta penale, pjesa e posaçme", Tiranë 2016, p. 167.

for adults, affecting them all as a society. Society lacks information about minor delinquency, which is required to reduce this widespread social problem.

- Revision of Article 129 of the Criminal Code to make it more comprehensive for cases of juvenile incitement, thereby adding as a significantly bigger measure.
- Revision of Article 129, treating encouraging of minors as an aggravating circumstance, increasing the criminal punishment for the instigator. To be more of a prima facie case, which on first appearance contains sufficient evidence to prove the elements of the offence, if we have to do with a minor under age of 14.
- Raising the minimum age for the criminal offense of "Inducing or encouraging juveniles" affecting 14-16-year-olds as the most vulnerable age to criminal recruitment.

Nomenclature

CCA Criminal Code of Albania
ILO International Labor Organization
JCJC Juvenile Criminal Justice Code

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Worst Forms of Child Labour Convention, 1999 (No. 182)

Use of Simulation for Phase Transitions Testing

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Abstract

In this paper we used programming environment of program code *Mathematica* for the development of efficient Monte Carlo (MC) simulations of Lenz-Ising model for the purposes of computer aided lecturing in the field of phase transitions and critical phenomena. We found motivation for this work in the fact that the best results in lecturing are achieved by the experiment and direct activity of students. Since the phase transitions and critical phenomena encompass very complex areas of physics, any help is very welcome. These simulations last for a few seconds and are therefore very suitable for both instructional and independent work. Another usage of performed simulations may be in the introductory parts in the field of computational physics or MC simulations.

Keywords: Monte Carlo simulation, 2D Ising model, phase transitions, education, demonstration.

1. Introduction

Phase transitions and critical phenomena (Baus, 2008; Gitterman, 2004; Papon, 2006; Yeomans, 1992) represent a very specific area of modern physics and materials science for several reasons. Primarily, it is necessary to understand this area if there is a desire to accomplish the thermodynamic description of new materials. From the standpoint of experimental physics, phenomenology of phase transitions can be very efficiently presented in the various undergraduate courses for students of physics, as well as for non-physics students. Furthermore, it is a very popular area because new materials are being synthesized every day.

However, from the standpoint of theoretical physics, it is a challenge to cope with this area of physics for at least two reasons, there is a need for strong prior knowledge of quantum and statistical mechanics and it requires a considerable amount of time. One of the mistakes, which are often made, is poor introduction and lack of adequate examples.

For this reason, we decided to re-invent the introductory part of this area. We implemented computer simulation to explain the spin alignment in crystals (ferromagnetic). We believe that computers could make adequate examples; in other words, we were convinced that the subject is best thought through experimentation and examples. In our interpretation, these experiments are Monte Carlo (MC) simulations of Lenz-Ising (LI) model. We shall use Lenz-Ising abbreviation instead of just Ising model since the Ising himself stated that model should bear the name of both physicists (Niss, 2005). Moreover, each simulation is in principle an experiment, although under deterministically controlled conditions. The fact that computers can actually help in such a way is apparent in (Psycharis, 2011) where the results are quite clear.

Due to its simplicity and generality, MC simulations (Binder K., 2010; Dagpunar, 2007; Fytas, 2019; Graham, 2013; Herdeiro, 2016, Rubinstein, 1991, 2007) are an interesting approach in research, not only in physics but also in science generally.

The fact is that it is easy to model the interaction of observed system with the environment using LI model. This is the main reason why we chose this approach via MC simulations. The LI model is simple and that it is possible to build a MC simulation in *Mathematica* with minimal programming skills.

2. Methods

Programming environment of *Mathematica* was used to make Monte Carlo simulations of ferromagnetic phase transitions. Main factors of simulation are fluctuation-dissipation relation and Metropolis algorithm. Fluctuation-dissipation relation connects fluctuations of system at thermal equilibrium with main thermodynamic quantities such as heat capacity or magnetic susceptibility, while Metropolis algorithm is used for calculation of quantities which figure in fluctuation-dissipation relation.

3. Introduction to Phase Transitions

First, the authors offer a crash course in thermodynamics and then repeat the necessary elements of quantum mechanics and statistical mechanics. After that, the phenomenology of phase transitions is given as well as various examples and classification of phase transitions. Then we have a concrete example of the model, which is Ising model (Komatsu, 2018; Martins, 2015; Nisoli, 2016; Ren, 2016). The first to be dealt with is relatively easy 1D case, the exact calculations, and then proceed to the 2D solution of the case. Unlike the 1D case, the 2D case is not given step by step but we say something about difficulties related with this case and then move on to the conclusion, discussing the results related to the obtained critical exponents. The standard reference for the phase transitions and critical phenomena is the book (Stanley, 1987), although the Onsager's solution is not extensively discussed. On the other hand, another reference which is standard is (Zotos, 2007). Unlike (Stanley, 1987), in (Zotos, 2007) we have the exact solution of 2D case in detail.

3.1 Thermodynamics and Statistical Maechanics

Instead of detailed and at the same time exhausting recapitulation of thermodynamics we think that material presented in the textbook (Newman and Barkema, 2001) is enough for the purpose of recapitulation needed for understanding this paper. As the phase transitions and critical phenomena are treated in details only at postgraduate studies, it is logical to expect that for physics students a shorter recap is sufficient which should include the following: the partition function, the most important thermodynamic quantities, thermodynamic potentials and ensembles, fluctuations, phase transitions of elements (classification, critical point of order parameter). If, however, a non-physics student is interested in the field of phase transitions, a detailed analysis of the basic thermodynamic principles, especially the story about the thermodynamic potential, is required.

It is important to analyze in details fluctuation-dissipation relation. It is not hard to obtain so we will just write end relations, which connect fluctuations with heat capacity, and relations linking the fluctuations to the magnetic susceptibility:

$$C_V = \left(\left\langle E^2 \right\rangle - \left\langle E \right\rangle^2\right) / kT^2 , \tag{1}$$

$$\chi = \partial \left\langle M \right\rangle / \partial H = \left(\left\langle M^2 \right\rangle - \left\langle M \right\rangle^2\right) / kT . \tag{2}$$

For writing simulation code we use exactly the relations (1) and (2). By analysis of these relations, we conclude that it is possible to determine the thermodynamic quantities through fluctuations of certain quantities. In the case of heat capacity, the quantity fluctuations, which we observe, are system energy spectra, while in the case of magnetic susceptibility we observe magnetization of the system.

3.2 Lenz – Ising model

Lenz-Ising (LI) model is in detail described in (Brush, 1967; McCoy, 1973). LI model is a typical example of a rough approach to the explanation for the ferromagnetism. The only thing that is more fascinating from the roughness and simplicity of this model are the excellent results obtained by its application. Physics is a science that has proved so many times its practicality by application of simple principles for an explanation of various complicated phenomena. If, guided by the principle of Occam's razor, we would like to make the list of the most useful models (not only in the solid state physics, but in general), LI model would find its place among the top five. It is also one of the most researched models in modern physics. Often, physicists from all over the world are amazed how such simple and instructive approach can lead to extraordinary results.

It is very important to note that LI model can be applied in situations other than ferromagnetism, which we will mention later in the text. Particular importance of LI model for computer physics is that it is the best example for the use of MC simulations. Reference textbooks in the field of MC simulations take LI model as a starting point. Many algorithms are implemented and tested on this model; the only question is which programming language and programming environments to use. The best results in the field of MC simulations of LI model are obtained in languages like C, FORTRAN and Python, but generally, examples of the application of MC simulations in instructive programming environments, such as *Mathematica*, are missing. Of course, one should bear in mind the limitations of *Mathematica* in terms of loops and programming syntax. Despite of this, it is possible to make simulations that help students to become more familiar with the problem of phase (non-) regularity, and then with the possibilities of computer physics, together and with MC simulations and the corresponding algorithms, which is precisely the objective of this project.

According to the LI model, examined ferromagnetic material consists of aligned spins, each of which can be found in one of two states, depending on their orientation. In Figure 1 and 2 we have the example of 1D and 2D model LI.

Figure 1. Chain of spins

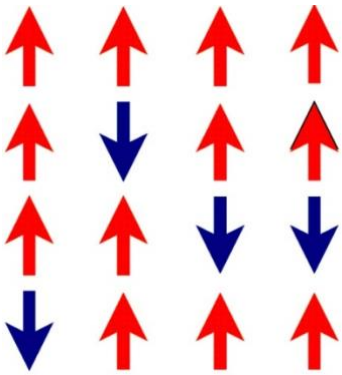

Figure 2. 2D lattice of spins

Of course, it is essential to specify the expression for the energy of the observed system, which, in the absence of external fields and in the approximation of the nearest neighbors, have the following form:

$$E = -J\sum_{j=1}^{N}\left(s_i s_j\right), \tag{3}$$

where the sum is taken for all pairs of neighboring spins, labeled with $< ij >$, while J can be treated as exchange constant[1], which is assumed to be positive. The state of such spin system is determined by configuration of spins. Then relation (3) represents the energy of a certain state in which the system is observed.

Before the quantitative study of the LI model, we will consider the expression for the energy according to which the interaction energy of two neighboring spins is equal to $-J$ if they are oriented in the same direction, and is equal to J if their orientation is in the opposite directions. According to the basic concepts of LI model, all the spins are parallel to each other and a direct consequence of such pictures is that the magnetic moment of such a system is different from zero, i.e. we have a ferromagnetic structure. Furthermore, a system that has a magnetic moment in the absence of magnetic field has, what is usually called, spontaneous magnetization.

Although the energy of a system of spins is the lowest if all spins are mutually parallel, it is also necessary to consider the effects of breaking of such alignment due to the temperature changes. We will assume that our observed spin system is in equilibrium with a reservoir of temperature *T*, in order to use description of canonical ensemble. Over the time, the spins change their orientation and by each spin configuration change, we consider that the system passes into another state. One of the main results of statistical mechanics is that the probability of finding the system, which is in equilibrium with the thermal reservoir, in any particular state, is proportional to Boltzmann factor:

$$P_\alpha \sim \exp\left(-E_\alpha / k_\mathrm{B} T\right). \tag{4}$$

Here E_α is the energy of state, and k_B is Boltzmann constant, while P_α is the probability of finding the system in the state α. Any of the states is actually a certain configuration of spins, and these states are referred to as *microstates* of the system. If the observed lattice consists of *N* spins and if each spin can be found in one of two states, using elementary combinatory it is easily concluded that we could have 2*N* different possible microstates of system. In order to have a more realistic picture, we shall observe systems for which *N* is very large; therefore, we shall have a large number of possible states.

From the microscopic point of view, the interaction of the spin system with the thermal reservoir is responsible for transitions from one state to another. Some spins are flipped from +1 orientation to –1 and vice versa, thus receiving or giving energy to the thermal reservoir.

From the macroscopic point of view, measuring of quantities such as total magnetic moment (magnetization) is effectively averaged through large number of microstates, which the system enters during the sole act of measuring. In order to determine macroscopic behavior we have to calculate the probability of finding the system in different microstates.

[1] Actually, it is the measure of how high is the intensity of the interaction of two neighboring spins.

Before we proceed to the specific example of simulation we shall mention that a relatively simple LI model can be grouped, i.e. spins can be "allowed" to be found in additional states, other than just + or – orientation. For example, we can allow the spins to rotate freely in the plane (XY model) or in 3 dimensions (known as Heisenberg model).

3.3 Exact Solutions of 2D Lenz-Ising Model

The first and the easiest approach through which it is possible to obtain exact solutions of LI model is the Mean Field Theory (MFT) (Kenji, 2007). The main advantage of this approach is its simplicity and excellent results concerning the critical temperature. However, using this approach it is not possible to obtain good results concerning critical exponents.

Now is a good opportunity to explain shortly the term *critical exponents*. In general, the line of phase transitions is ended by *critical point* (Stanley, 1987). Close to the critical point, the system behaves in an extremely unusual way. The differences between phases simply disappear, i.e. phases become identical. Close to the critical point, basic response functions of the system diverge and the following laws are observed for heat capacity, magnetic susceptibility and magnetization:

$$C \propto (-\tau)^{-\alpha'}; \qquad \psi \propto (-\tau)^{-\beta}; \qquad \chi \propto (-\tau)^{-\gamma}. \tag{5}$$

C is specific heat, ψ is order parameter (in our case magnetization) and χ is magnetic susceptibility. Given exponents: α', β and γ are known as *critical exponents* and their main property is the universality, e.g. they have the same values for large number of different compounds.

It is very important to explain the meaning of *order parameter* (Stanley, 1987; Huang, 1987), which can be found in relation (5). It is the quantity which value becomes zero on the critical temperature, while it has some finite value below critical temperature. In the case of magnetism, the order parameter is magnetization. Somewhat later, we shall see its temperature dependence and we shall see how its value drops to zero exactly on the critical temperature.

Another approach is through the transfer matrix method by which we come to the famous, mathematically very exhausting, Onsager's solution.

3.4 Mean Field Approach and Onsager's Solutions

In general, a system consisting of many particles, such as the magnetic material, which interact mutually, is very difficult to solve analytically, except for very simple cases.

The main idea of MFT is to replace the *n*-particle system by one-particle problem in adequately chosen external (averaged) field. In this way, we replace the complicated interactions between the particles by interaction of one particle with a field.

By MFT approach, an excellent result concerning the critical temperature is obtained, but what is not in accordance with the experimental data are the values of critical exponents. However, considering that the approach to the MFT is the relatively easy and understandable, the results are not bad at all. Here we shall state only the results in terms of values of critical exponents obtained by MFT:

$$\alpha = 0, \quad \beta = 1/2, \quad \gamma = 1, \quad \delta = 3. \tag{6}$$

On the other hand, notwithstanding that, theories of averaged field are understandable to students and Onsager's exact solution of two dimensional LI model is mathematically exhaustive.

We will not deal with details of Onsager's solution, but we shall mention a very important observation in relation to the specific heat. i.e. the specific heat diverges logarithmically as we are approaching the critical temperature. The results of Onsager's solution for the values of critical exponents are:

$$\alpha = 0, \quad \beta = 1/8, \quad \gamma = 7/4, \quad \delta = 15. \tag{7}$$

4. Lenz-Ising Model and Simulations

In this chapter we shall see how we can use the LI model and the programming environment to obtain the terms that exist in the expression for heat capacity of ferromagnetic using Metropolis algorithm (MA).

As we have seen in relation (1), in order to determine the heat capacity, we need to determine the mean energy values. In general, the mean value of continuous variable is given as:

$$\langle Q \rangle = \int Q(x) P(x) dx \Big/ \int P(x) dx, \tag{8}$$

where $P(x)$ is the probability distribution of quantity $Q(x)$. When we deal with computing related to the atomic and molecular properties, P is the Boltzmann distribution, and the denominator is the partition function Z. If the energy levels are discrete, each integral is replaced by sum.

Here, we shall specifically use the MC method for calculating energy fluctuations. As for the case in which the larger number of repetitions of the experiment means higher precision, for the MC simulations the same effect is achieved by higher number of "probes". What we actually do with the MC method in this case is that we average the energy and magnetization fluctuations and for this purpose, we will use precise MA.

4.1 Modeling of Spin System Interaction by Monte Carlo Simulation

The goal of MC simulation is the interaction of spin system with the surroundings by using an adequate algorithm. Of course, in statistical mechanics, we consider environment as a thermal reservoir whose role is to exchange energy with observed spin system and therefore we have the spin system in equilibrium. The spins are flipping and thus lead to the changes of microstates. Each microstate corresponds to a particular configuration of spins. In such a case, the measured macroscopic quantities depend on the probability of finding the system in certain microstates.

MC method uses a stochastic approach to simulate the energy exchange between the spin system and the heat reservoir. We begin by considering a system in a certain microstate, for example as illustrated in Figure 3.

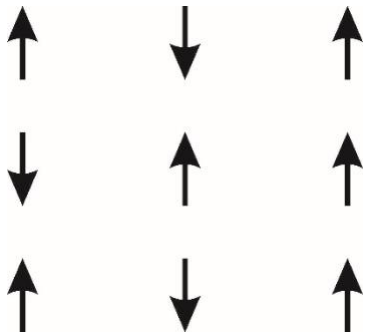

Figure 3. Example of random spin configuration

Further, exchange of energy of the spin system with a heat reservoir is modeled according to the principle described in the next subsection.

4.2 Metropolis Algorithm

The MA is a general MC method by which we can calculate the mean values by random sampling of system configurations and retain only those that have a significant contribution to the mean value of the quantity of interest. Specifically, in our case of LI 2D model, the most important advantage is reflected in the fact that by using MA we are avoiding complicated computation of the partition function.

MA is actually a "random walk" through various configurations. Such random process is called Markov process and it is useful to think of it as a process in which the system "goes" from one place to another randomly, with no memory of previous state. In short, MA could be presented explicitly as follows, and then we will analyze MA application to our case of 2D LI model:

(1) Initialization of parameters, i.e. choice of the initial state[2]
(2) Select a random place of observed quantity[3] and,
(3) Calculate the energy change that occurs due to the fact that we have changed the characteristic quantity[4] of the system at randomly chosen place in the previous step,
(4) Generate a random number r such that its value is $0 < r < 1$,
(5) If $r < \exp(-\Delta E/k_B T)$, we change the value of the characteristic quantity that we observe at the randomly selected position and,
(6) Randomly move to the next place and repeat everything from step 3.

What we get with MA are energy changes that occur due to changes in orientation of spins. Step 5 serves to roll out those values that do not have a major contribution, which is regulated by the Boltzmann probability.

Increasing temperature leads to flipping of spins and result of flipping of spins is the change of energy. Any change in energy, if it is allowed by step 5, is "remembered" and summed by computer code that is eventually used to find a mean value (simple divide of summed values by the number of steps that we chose).

The following should be also noted. In the beginning of the simulation the temperature at which the system is located is very low due to which the term $\exp(-\Delta E/k_B T)$ is very low, and thus the probability to accept the new configuration of the system is very

[2] In our case it is such a spin configuration in which all spins have –1 orientation (all spins are down spins).
[3] In our case it is a spin.
[4] In our case energy change occurs due to the spin flip.

small. In other words, at very low temperatures the energy changes that are accepted are low. With increase of the temperature the factor $\exp(-\Delta E/k_B T)$ is also increased, and therefore more energy changes are accepted.

5. Results and Discussion

We have developed three programs, written in *Mathematica* which can be used for teaching of phase transitions:

- ✓ Temperature dependence of heat capacity,
- ✓ Temperature dependence of magnetization,
- ✓ Temperature dependence of magnetic susceptibility.

In this paper, we have presented and examined the results of all programs and discussed how those results can help in understanding the phase transitions and critical phenomena. Previously, we shall comment on programming environment.

Our choice of the programming environment is *Mathematica*. Since *Mathematica* and *Maple* are the main competitors within the academic computer users, we shall state the reasons for our selection of *Mathematica* as the programming environment.

As for the performances, reference (Zotos, 2007) goes in favor of *Mathematica*. The good reason for the selection of *Mathematica* is its accessibility and popularity. It should be noted that if one has (any) experience in programming in *Pascal*, *Basic* or *C*, then they would prefer *Maple* programming syntax. On the other hand, the fact is that *Mathematica* is faster, but the syntax is completely different and suitable for absolute beginners. Of course, one should bear in mind the financial parameter, e.g. student version of *Mathematica* is very convenient compared to other solutions. It is very important to stress that the time needed to perform simulations is very reasonable, simulations last for several seconds on standard laptops configurations (simple dual core processor and 2 GB of RAM memory)!

First program for the analysis and discussion is the one that deals with the temperature dependence of heat capacity. What is certain is that every teacher will on several occasions underline and emphasize that on the critical temperatures the heat capacity tends to infinity. On the other hand, the question is how the heat capacity tends to infinity.

What we need to note here is that we use fluctuation – dissipation relation and that we are practically using MA for determination of $\langle E^2 \rangle$ and $\langle E \rangle^2$, i.e. we use it to measure fluctuations. Temperature dependence of heat capacity is given in Figure 4.

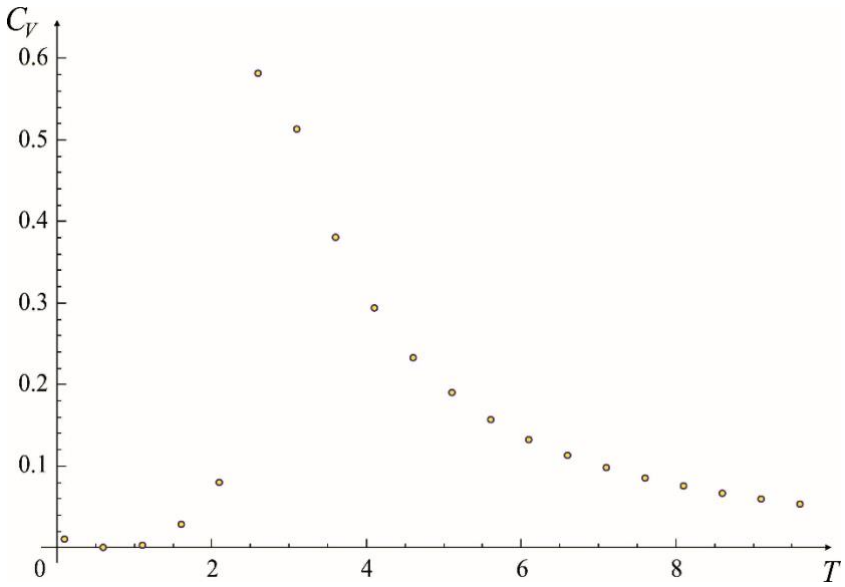

Figure 4. Temperature dependence of heat capacity

Figure 4 shows the result of simulation concerning the temperature dependence of heat capacity. It is clearly visible that there is a singularity on the critical temperature. Also, it is clearly visible that singularity occurs on the temperature around 3 K, which a great result if considering that it is well known that the transition occurs at a temperature of 2.27 K. In general, there is a slight discrepancy concerning the values of critical temperature due to the fact that a small number of MC steps are taken. When this number is increased, of course, one obtains more accurate values for the critical temperature. Here, this number is reduced, in order to have a reasonable duration of simulation – about 3 seconds. After singularities and critical temperature follows discussion on how the heat capacity reaches singularity from both sides, which is entirely in agreement with reference data.

The parameter which can be changed here is the number of spins of the square lattice, the number of MC steps, temperature interval and temperature range, coupling constant and boundary conditions. A simple task could be assigned for students; firstly to run

simulations with a small number of spins of quadratic lattice and for a small number of MC step. For example one could start with a grid of 5×5 spins and 1000 MC steps, then moving on to the 8×8 grid and for example 2000 MC steps and to complete all by the third simulation with grid of 12×12 spins and 3000 MC steps and each time to record obtained graph. Beside the fact that simulations would last longer, obtained figures for higher number of spins and MC steps would have sharper peaks on critical temperature. In other words, singularity would be more visible.

The next parameters that could be changed are the boundary conditions. Students' task could be to delete the two lines of code related to the boundary conditions. Thus we would remove the periodic boundary conditions. What students should notice is that the biggest difference in behavior is near critical temperature.

The next program, the temperature-dependence of magnetic susceptibility is very similar in the form and results, and serves as an excellent supplement to the previous program. Namely, here we re-use the results of fluctuation-dissipation relation (2), now to track fluctuations of magnetization.

Comments regarding singularity and critical temperature are the same, while figure is something different and is given in Figure 5.

The next program is related to the temperature-dependence of magnetization (the result is given in Figure 6) and is very important because, based on this program, one can later calculate the value of critical exponents, which is the essence of theoretical physics of phase transitions and critical phenomena.

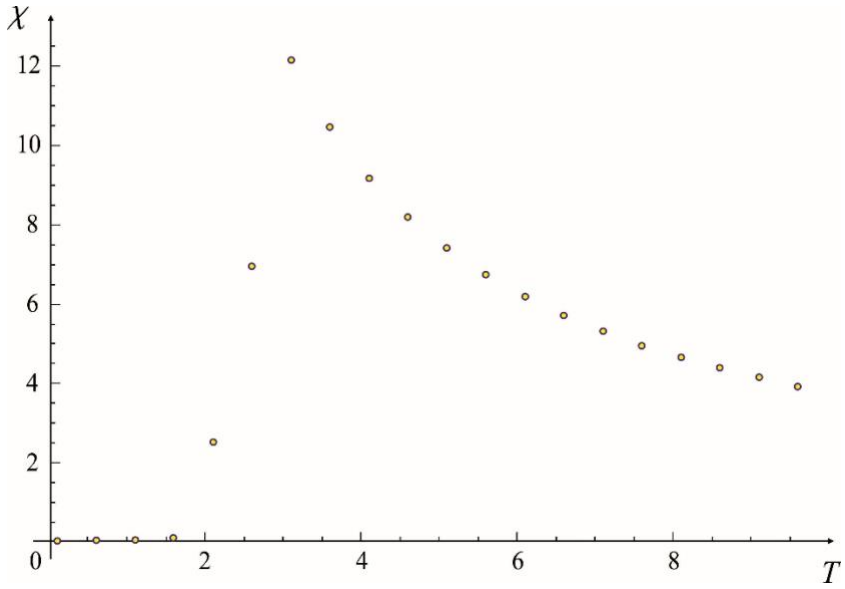

Figure 5. Temperature dependence of magnetic susceptibility

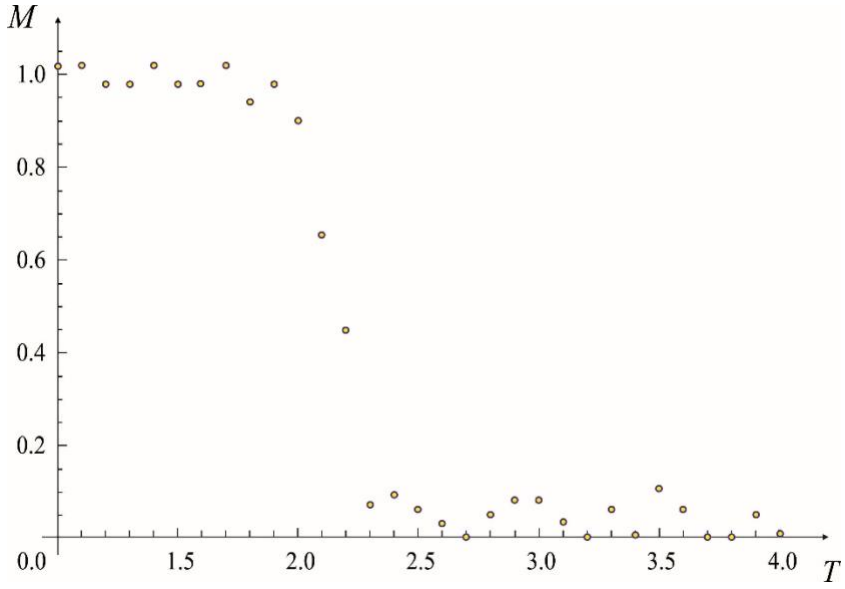

Figure 6. Temperature dependence of magnetization

As we assume that at very low temperatures all spins are parallel, it is not surprising that the magnetization obtained at the beginning of the simulation equals one. The most important thing for this program is that the critical temperature is around 2 K, i.e. the value

of the magnetization drops sharply, to reach the zero value on temperatures higher than critical value. In other words, below critical temperature we have spontaneous magnetization, which disappears when the temperature rises above the critical value. The conclusion is that we have a transition from the ferromagnetic to paramagnetic phase. All this, of course, is in agreement with experimental and reference data.

In the end, we will show how one can calculate the value of the critical exponent from the data obtained for the temperature-dependence of magnetization. Namely, it is common that while teaching the phase transitions and critical phenomena, some lecturers virtually never mention how to actually calculate the critical exponents. Here we will shortly describe two ways in which we can calculate the value of the critical exponent.

Once we obtained results for the temperature-dependence of magnetization we can use them to calculate the exponent β by drawing graphics of $\log(M) = f(\log(T–T_C))$ and then find the slope of the obtained line. The value of line slope is precisely the value of critical exponent β, because for the magnetization we have a relation with exponent β:

$$M \sim (T - T_C)^{\beta}.$$

Another, somewhat easier, way for the calculation of critical exponent β is to make graph M^{1/β^*}, where β^* is the test value of the critical exponent. At the critical temperature the right value of β^* is the one for which one receives the best linear dependence of graph M^{1/β^*} as a function of temperature. In other words, we simply try several values of β^* and conclude for which value we receive the best linear dependence. In this paper, we used the first method and obtained the value of 0.178, but it might be a good idea to leave this as a task for students.

5. Conclusion

In this paper, we showed that *Mathematica* programming environment could be relatively easily used to create effective simulations that can be used in teaching the phase transitions and critical phenomena.

The main advantage of these simulations is an easily understandable programming code in which it is not hard to manipulate with parameters of the simulation. Through availability of computers and data centers, this approach in studying or teaching of a thematic unit is becoming more and more popular. The next logical step would be to use programs in lectures, in the field of phase transition and critical phenomena.

The next advantage of these simulations is the fact that, in this form, they can be used for another subject, for example, for an introductory lecture in the MC simulations.

Another advantage is the simple and friendly *Mathematica* programming environment that is particularly suitable for those students who have relatively modest programming knowledge. On the other hand, those who already have certain programming skills in Pascal or C might find Maple a better solution.

Acknowledgment
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Self-organization in the social plane as the basis of the parallel system

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Abstract

The legal/constitutional reality of '89, through which not only a political reality was being tried to be changed, but also an ethnic and social one, produced more and more aggravating circumstances, which naturally made life difficult and, in many cases, even made it impossible.
While the efforts of any form for submission and degradation did not cease, on the other hand as a result of such a state other new efforts were produced which were in the function of preserving the being and survival.
Facing this reality was undoubtedly becoming more difficult, and thus also making it impossible for life to develop in normal circumstances, at the moment when the tendency appeared to implement a policy of submission, a total of 90 percent of Albanians employed in the state economy - about 115,000 people lost their jobs. So, it was this abnormality that disrupted the normal institutional order, and also produced successive challenges to the extent of deepening the social crisis in the country.
The escalation of the situation on various levels, imposed first and foremost self-organization on the social level, as a single opportunity to cope with the aggravated situation. The situation that the Kosovar society was facing and this interaction itself, speaks openly that during this period of 90-99, we encounter these forms of self-organization of Albanians, is with Solidarity and Philanthropy.

Keywords: solidarity, philanthropy, legal/constitutional reality, political disobedience

Introduction

Self-organization in general, self-organization in the social plane in particular, is without a dilemma a culture which has proven itself in many societies. Somewhere more and somewhere less, it has left its marks, albeit in new contexts and circumstances.
Eminent authors in this field have seen it from different perspectives, especially through the prism of a social justice. Here we single out authors like: (Miller, 1999)**,** (Budz, 2021)**,** (Stewart, 2017)**,** (Fuchs, 2003)**,** (Bryant, 1993)**,** (Ismael, 2010)**.**
However, our case of study is a *sui generis* case, and as such we will treat it in the context of this paper. The entire idea to give a scientific observation to such a self-organization, comes exactly as a need of the time to highlight a reality of a society which, faced with political, social and economic injustices, is forced to find social justice in its struggle for survival after a very important process, that of political disobedience. This action has also been studied by various authors, who have presented the most diverse and extremely important theses for and on our study. Here we will be based on authors like: (Arendt), (Thoreau), (Jason, 2013), (Scheuerman, 2018), (Allen, 2017), (Gautney Heather, Dahbour Omar, Dawson Ashley, Smith Neil, 2009), (Gautney, 2010).
On this basis, a need for a study in this field within the Kosovar society rises, which would bring innovation in this field of study. Although it is not something new for the Kosovar society, there is no doubt that it is a novelty in the field of human self-organization studies in the social field within this society, and as such I consider that it enriches even more the studies in this field. In this spirit, I strongly believe that a special case will be added, and also extremely important in the field of human studies, like in theories on social, political, health and economic self-organization. This paper presents a *sui generis* case, in the same way the case of Kosovo has been treated, and I am convinced that it will enrich the field of studies of resistance and parallelism.

Self-organization in the social plane as the basis of the parallel system

The legal/constitutional reality of '89, through which not only a political reality was being tried to be changed, but also an ethnic and social one, produced more and more aggravating circumstances, which naturally made life difficult and, in many cases, even made it impossible.
The attack on all levels, aggravated survival even more, aggravated the effort and resistance facing all those forms to subjugate this category of society, and this is confirmed by Jusuf Azemi, vice president of the Independent Trade Union of Small Economy and Handicrafts of Kosovo, while stating that "This was the most difficult period of economic, social and political life since at this time all the rights of Albanians were abolished in the political, economic, social and other aspects. The Government of Serbia, through

the dismissal of workers and the punishment of craftsmen, tried to kneel the people of Kosovo and make them accept the violent organs of Serbia" (Azemi, 2021).

While the efforts of any form for submission and degradation did not cease, on the other hand as a result of such a state other new efforts were produced which were in the function of safeguarding the being and survival.

Facing this reality was undoubtedly becoming more difficult, and thus making it impossible to develop life in normal circumstances, at the moment when the tendency had arisen to implement a policy of "the submission of a total of 90 percent of Albanians employed in the state economy - about 115,000 people lost their jobs. In the Trepça mine, for example, 4,820 Albanian workers were fired, in the construction company "Ramiz Sadiku" 4,700, in the Ministry of Internal Affairs 3,705" (Schmitt, 2012, p. 247).

So, it was this abnormality itself that disrupted the normal institutional order, and also produced successive challenges to the extent of the deepening of the social crisis in the country.

The escalation of the situation at various levels, imposed first and foremost the self-organization on the social level, as a single opportunity to cope with that entire aggravated situation. Therefore, "life in the environment in which Kosovo was, could have hardly spared anyone - who at least at one moment was not challenged to accept one of the three central roles of the philanthropic phenomenon: the role of the ideator and organizer of actions to mitigate poverty that has never been lacking, especially in Kosovo (to make others aware of the need to "open the bag and the heart"), or with the challenge of mercy and accepting the role of aid provider - in whatever form the situation has required; or with the role of the beneficiary of those aids" (Berishaj A. K., 2010, p. 11)

The situation the Kosovar society was facing and this interaction itself, speaks openly that during this period of 90-99, we encounter these forms of self-organization of Albanians, ie with Solidarity and Philanthropy. Both of them have their source in a not easy social reality after the legal/constitutional one, which did not spare anyone or anything that was contrary to such a policy which tried submission in every form.

The attack by such a policy revealed the need to offer help to each other, and at the same time for a stronger connection between themselves.

So, Solidarity and Philanthropy come as an inevitability in facing and coping with that increasingly aggravated socio-economic and political reality.

But what is Philanthropy, since when does it exist, and how do we view it? "The etymology of the notion philanthropy is related to the ancient Greek and is a name - a composition from the words ... friend (love) and ..... - human (humanity). It is translated as love of human, charity and the desire to help others. There is evidence about philanthropic activities from the periods of ancient Egyptian, Indian, Hellenic, Christian, and early Islamic civilizations. It is possible that due to the context of the circumstances, where the first appearance begins, the vital importance of the philanthropic act and human nature itself as a social being, philanthropy as a charitable activity, has taken on mythical attributes since ancient Greek mythology, in the tragedy 'Prometheus Bound'" (Berishaj A. K., 2010, pp. 15-16).

Philanthropic actions which date back to antiquity also testify to the need of mankind for such actions, as well as for love, understanding between people.

Numerous and approximate or even similar notions and definitions are those known for and on philanthropy itself, which find a conjugation between philanthropic actions themselves.

Whichever variant which is taken as a basis, be it the Greek or Latin, the truth is that by the notion of philanthropy, we mean love, understanding, mercy, support and help for the other, or more precisely we can say that Philanthropy itself is known as a common denominator of the actions that are in the service of the common good.

If we refer to the many initiatives that have been undertaken voluntarily in Kosovo and abroad for a whole decade, we see that they had only one goal, namely the common good, and that speaks openly about the philanthropic threads within this society.

Any of these notions about and on philanthropy in the theoretical plane we encounter in the practical plane over a decade in the Kosovar society, more pronounced than ever before.

Like Philanthropy, Solidarity also appears at this time in the Kosovar society as an almost unique opportunity which would help maintain its existence, and at the same time of the being itself opposite a constant tendency to subjugate and kneel it through various social crises that were created with full awareness of certain political goals.

Therefore, the display of solidarity to an extraordinary degree comes as a self-created opportunity, and at the same time as a response in order not to give up to all those attempts for submission.

The power of practical self-organization is based precisely on a need for connection and the necessity to give an answer to the situation on the field, which, first of all, required an answer from solidarity. So, the term 'solidarity' refers to the belief in common goals and interests. Solidarity is considered as a source of strength and endurance and, implicitly, for unity associated with a single objective. It is thought that the belief in solidarity as a value in itself, and not as a means for a purpose, characterizes the traditional working class as a * service community. It was considered that, in such conditions, shared work experiences and community life generated and nurtured strong feelings of brotherhood, as well as values of mutual assistance and participation" (Marshall, p. 397).

This definition of the term solidarity is the fairest and clearest definition of the entire situation and behaviour of Albanians during this period, and also throughout the entire time of the construction of the parallel system in general, and self-organization in the social plane in particular.

So it is this sense of solidarity and behaviour that sustains this society and also ensures its survival, while it was seriously endangered at a time when the struggle for survival was first and foremost.

The feeling of solidarity within this society was constantly developing at all levels, and thus becomes the special pillar on which existence itself weighed. For a whole decade, solidarity develops tremendously, and becomes the foundation of all subsequent developments in the country and abroad. "Without the organization in the social plane, the organization in the educational and health plane would not work either, because for an education worker to be able to teach a student, he first had to have at least a social support, because it was not possible to teach the student if the teacher did not have the elementary things at home" (Azemi, 2021).

So, both Solidarity and Philanthropy during this period, whether as a will, desire or even as an imposition, come to the Kosovar society at this time precisely from the political, social and cultural insecurity, which made demands towards the need for a social and political organization.

Already, when among the few links of connection with the former state organization for Albanians remained the acceptance of personal identity documents issued by the Serbian administration and the fulfilment of obligations regarding public services, they, "in the political, educational, cultural and partly in the health and social protection plan, were separated from the state administration and control" (Krasniqi, 2013).

Seeing that the general flows were leading to the daily abyss, the citizens of the country were aiming for something different, trying to give meaning to the meaninglessness, changing directions and approaches towards national and social issues in general.

This was the period when Kosovar society demonstrated extraordinary organizational maturity, giving meaning to external slavery through the acquisition of an internal freedom, in response to isolation, torture and constant pressure. In this way, we see that the created circumstances were opening new paths, also producing new decisions, "caught in the private sphere, the Kosovo civil movement occupied a public space denied by Belgrade. Good or bad, education is operating (lessons are held in private homes), as is publishing, healthcare (a network of private 'clinics') and a form of social solidarity that ensures everyone not to starve from hunger; with a source from 'reconciliation councils' that, in 1989-1991, made it possible to put an end to blood feuds throughout the country, a kind of justice will also work..." (Rugova, 2005, p. 37).

With such a denial of the public sphere, of course, the individual and collective action was precisely in the sole attempt to build a parallel system and self-organization at the social plane, in order to preserve survival, and that in this form a sense of self-confidence was created which was further strengthened by the resistance that developed through solidarity.

So, self-organization derived from the self-solidarity shown among each other, creating new opportunities and ways of helping each other, and preventing all the social pressure exerted, through dismissals from work, dismissals from school, etc. This extension of homogenization as a response to the extension of pressure, Buxhovi sees as an internal link which is built on the premises of insecurity, while solidarity as "the only and last means of protection" (Buxhovi, 2012, p. 507). This was proofed in every field, because people kept themselves alive through helping each other; families supported each other.

The psychological awareness and preparation for self-organization at the social plane was already surpassing any other form of organization and that this was manifested through various means other than the three percent. "If, for example, 30,000 Albanians work in Germany, it means that 30,000 families in Kosovo receive assistance. And families help families. They ask us: "Which family does not have the means to survive?" and send money, even if they don't known each other at all (Rugova, 2005).

The solidarity which crossed the borders of Kosovo, can be considered as the basis of other parallels that developed thus producing a unification in a war now not only psychological, but also social and economic.

"Internal solidarity, starting from the immediate family, to extend to the wider family and then to the neighbourhood, community and beyond, to go to the highest point of the extension, from where it would then be directed to various sides, where it was most needed, would not be successful without the participation of many Albanians from Macedonia, those from the Presheva Valley, Montenegro, Croatia and Slovenia where many Albanians lived and worked. Likewise, the concept of solidarity would not be successful without the great and unreserved help of Albanians from the diaspora, the ones from the United States of America and various European countries" (Buxhovi, 2012).

All these actions in the field of philanthropy and that of solidarity, would be almost impossible, without that power of *Self-organization*, which became a great hope in the most hopeless time, when everything was tried to be collapsed within society. If "social life comes from a dual source, the similarity of consciences and the division of social work" (Durkheim, 2004, p. 27), then all of this derives from the conscience to offer help to the other. So it is also related to the moral side, because "everything that is a source of solidarity is moral, everything that forces someone to take other people into account is moral, everything that forces one to regulate his behaviour through something else than the survival of his ego is moral and morality is so strong, as these threads are numerous and strong" (Durkheim, 2004, p. 45).

Self-organization on the principle of solidarity helped the Kosovar society in building and strengthening the parallel system, and also enabled the survival of the parallel state.

All the characteristics and forms of the social functioning of this period of survival, but also of self-organization "correspond to the Durkheimian concept of mechanical solidarity, but also to what is generally called in scientific theory - a society without a state" (Berishaj K. A., 2014, pp. 36-37).

There is no dilemma that this value of the Kosovar society is posed to a preliminary collective memory, thus continuing a historical tradition built on both necessity and inevitability.

At the sociological level, such a value has existed before, "Torsten Veblen is one of the sociologists who sees the development of society as a process, which is subject to a historical chronology, which goes through several stages. Within these stages it is possible to distinguish at least one decisive moment, after which society begins to change. For Durkheim this moment is associated with the change of solidarity, for Weber with the level of rationalization of the society, for Marx with changes in the character of social economic formation, for Foucault with the changes in the system of social supervision, for Baudrillard with the transition from a production society to the one of consumption, etc. For Veblen the transition is related to the mode of consumption. In modern society there is a growing need for people to differ from others through changes in consumption patterns. To clarify this, Veblen uses the concept of invidious distinction (Invidious - hated, disliked, envious.)" (Berishaj K. A., 2014, pp. 41-42).

Be it the change of solidarity, be it the level of rationalism of the Kosovar society, be it the system of changing the social supervision, all of these can enter within a single name, ie in the name of social, political, economic, healthcare and educational self-organization.

Throughout the study of this period, we can also notice a change of solidarity, and that this change in the Kosovar society stems precisely from the change of socio-political reality, "Halim Statovci, Albanian ethnographer from Kosovo, traced the exercise of solidarity in the Albanian community in Kosovo after the autonomy in the nineties until the transformation of traditional secular

traditions for help and solidarity among Albanians. These practices, despite the fact that they were applied in agriculture, farming, construction of houses, or cases of births, weddings or deaths, or in everyday life, such as the opening of a well, are governed by some rules that are complex, unwritten, but common to Kosovo Albanians. Modernization after World War II also brought new forms of aid, such as lending a tractor instead of lending a labourer. However, Halim Statovci argues that Serbian policy towards the Albanians in Kosovo encouraged the emergence of a new concept of solidarity at the national level, from which solidarity became all-Albanian, connecting all members of the nation with each other according to patriotic duty. In addition, the act of aid became an act of disobedience to Serbian rule in Kosovo" (Kostovicova, p. 113)/.

However, from the first point of view, solidarity as a value, in some cases is also understood as a form of moral obligation, or as a part of the formation of the individual, as a family culture developed in different relationships, although we see that solidarity also comes as a self-obligation that initially the individual, but then the collective does to itself beyond what we can view as a part of the education of society.

In this spirit of developing solidarity within the family and beyond the family we see how it develops either as a debt or as an education. As it was mentioned above that it is the socio-political change that has produced the change of solidarity, we can also see that the individual and the collective behaviour has changed, which speaks about the form of collective organization, but at the same time also about the culture of receiving and distributing goods which are in function of bettering and supporting people who are in a more difficult economic and social situation.

In this manner, we see how solidarity became an individual, family, kinship and collective value, thus integrating within itself all categories of society, albeit in different forms but within one contextuality.

In various studies there has been discussed on and about the debt to society, "since 1986 we have the famous study of Leon Bourgeois, entitled "Solidarité". Among the crucial thoughts on which Leon Bourgeois's position on solidarity is based is – that man is born a debtor of human association. Man, according to him, lives in a state of natural solidarity and need for other people and this is actually a prerequisite of life. So, as an essential point of reference of Bourgeois's position on solidarity, we can consider the idea of the so-called - social debt. The person by birth becomes a member of society ... since mutual dependence dominates in society, it turns out that the one who is richer and has more, becomes the biggest debtor of society in general" (Berishaj A. K., 2010, p. 146).

Whether as an individual or as a collective, the Kosovar society proves quite well that this debt built towards itself in the first place, and then towards others is a debt paid off in the best possible form, to the point of self-sacrifice.

This entire situation raised the need for internal solidarity, thus becoming the support point of Kosovar society, especially if we consider the fact that this effort for and on solidarity within the Kosovar society was developed on the interconnection between individuals, the interconnection between similarity and interdependence. The commitment for the mutual, making the efforts to also be mutual, made that solidarity actions, and other self-organizing natures to be contributing to the interconnection between individuals, but also between different groups acting in service of the same goal, albeit without any legal conditioning, but all this created on the basis of a debt and morality that the individual feels towards the other and towards society.

Precisely on the threads of morality and tradition of friends helping each other, the Kosovar society overcame the obstacles that appeared, thus producing a completely new solidarity reality. The forms of social self-organization of the Kosovar society where we encounter Philanthropy and Solidarity are of the most diverse, and have sprung precisely from necessity. However, this need has also produced many group initiatives within society which have aimed precisely at preserving the being and survival. In this regard, a key role was also played by the 'Mother Teresa' association, which in the principles of its action had made "the identification of families and individuals according to the principle 'the poorest among the poorest', the collection of assistance from members, donors and humanitarian organizations , the distribution of aid to families and persons regardless of nationality, race, language, gender, religion, the organization of actions for fundraising, for the construction of ambulances and other health institutions" (Përgjoka Pjetër, Berisha Rami , 2005, pp. 17-18).

In order for the activity of this association to be extended as much as possible, seeing also the great requests for help which are inevitable, but also in the course of self-organization and self-functioning, "for those who were in severe conditions, various forms of social solidarity were organized, and among the main ones, as we have already seen, were the funds organized by the unions, the LDK and the Mother Teresa Association;

-Almost every family had at least one member abroad: if they were employed, they sent as much as they could to their families. The most common amount is that the number of those in asylum rose to over 350,000" (Clark, 2000, p. 113).

Therefore, the presidency of this association in May 1990, decides to establish numerous committees which carried the burden of the best possible organization and operation of this Association, coming to the aid of all people, depending on their requirements. The Committees that were established within this association were: the Committee on Social Affairs, the Committee on Health, the Committee on Education, the Committee on Cultural Affairs, the Committee on Financial Affairs, the Committee on Cooperation with associations in the country and the world and the Committee on matters of collecting and distributing material goods, undoubtedly helped in the strengthening and more rational judging of the circumstances that were already inevitable, to strengthen the policies of disobedience and non-submission, but also to maintain survival.

It is this self-organization that built a strong system of resistance against the great violence and torture that was increased and exercised in every sphere of life. The dismissals from work, beyond the psychological and social pressure, were aimed at creating a situation where *Survival* was seen as an impossible mission and through this path the policy of ethnic cleansing would be achieved. In such a situation, one of the most important goals of this Association was to identify families in need and then the assistance that could be given to them.

If we take into account the records of families in need made by this association during those years, then we see that "in 1990 there were identified 2,450 families with 15,084 members, in 1991 were identified 26,700 families with 174,084 members, in 1992 were identified 43,320 poor families with 282,446 members, in 1993 there were 45,835 families with 373,994 members, in 1994 there

were 57,353 poor families with 373,942 members, in 1995 a total of 55,470 poor families with 373,942 members, in 1996 a total of 62,340 poor families with 404,465 members, in 1997 there were 59,700 poor families with 389,244 members" (Përgjoka Pjetër, Berisha Rami , 2005, pp. 17-18), and from these amounts it results that the number of families registered as poor families increases from year to year.

This was one of the first and most important steps in building a strategy for the collection of aid, but also for their distribution. What can be clearly seen from the actions of that time, as well as from the evidence today, is the fact that Philanthropy and Solidarity have been implemented within this society, and as never before they have been proven to be successful.

Forms of philanthropy and solidarity are not limited to one dimension of life, they include its all-dimensionality, thus expanding in terms of assistance in education, healthcare and everywhere else needed.

The expelling from school facilities, clearly prove how society was organized through social solidarity and practically made a solidarity with internal developments. The feelings of solidarity and philanthropism were felt precisely on the occasion of the closure of school premises, when many individuals opened the doors of their homes, thus creating *School Homes*.

This action was intended to leave children without space where they will develop learning and unable to return to school facilities, the strength and individual will not to stop the process was the only alternative, and at the same time to given an answer to all that violence that was already being exercised even on innocent children.

Of course, not better than in other areas, life did not function even in the healthcare field, especially after the phase of dismissal of the medical staff, for which the need arose for self-organization in this regard through the opening of humanitarian ambulances that operated within the 'Mother Teresa' Association. "The dismissal of Albanian workers from work, caused the Albanians to leave en masse from the health protection system as well. The Albanian population was not only endangered for existence, but the even greater danger came from the impossibility of health protection (Përgjoka Pjetër, Berisha Rami , 2005, p. 33).

In this spirit of self-organization, this cooperative power within this society, as much as it took shape it also took content, extending the level of responsibilities, but also of interventions on issues that were of general social interest. Beyond all this organization of life, there was the issue that it had to be preserved, and that of course it was not easy to be preserved in a situation where pressure was exerted, in a society where law and order did not rule.

These forms of all-round solidarity made the parallel state to take shape, and of course this was one of the most crucial things for this society, for the fact that "it would be even worse if Albanians were left without organization, without political structures, without parallel schools. Imagine all those young people (most of our population) on the streets, without any perspective, with this unemployment, with all these deprivations, and the state of tension" (Rugova, 2005, pp. 103-104). Through this form, a social solidarity has been achieved as never before in the Albanian society and also a kind of political solidarity by responding to the demands and needs of the time towards the achievement of a legal and legitimate right, but denied.

The solidarity, manifested and evidenced in its multidimensionality, was proved precisely in this period of exclusion and the tendency for defactorization of those excluded from public life.

Although attacked from deinstitutionalization, from exclusion and many other efforts of this nature through which it was tried to spread this category of society to different countries after exclusion, however it was precisely self-organization, the process which stopped such a project.

Despite facing such a situation of permanent threat and exclusion, parallelism was seen and remained the only way out for the Kosovar society, therefore it enjoyed the support of the majority of the population, which was also a direct contributor to the development of this system, and that exactly "collective risk aroused collective solidarity and volunteerism" (Berishaj A. K., 2010, p. 110).

Institutional closure, and the tendency to close life in general was one of the next attempts which failed, of course thanks to self-organization and the creation of mechanisms that would create a new order of behaviour and action both individually and collectively. Thus, the very "maintenance of parallel structures demonstrated the capacity for self-organization and influenced the realization of two essential but defensive goals - the safeguarding of the lives of Albanians in Kosovo and the denial of the regime's intention to disperse the Albanian population. They relied mainly on the Albanian community and the diaspora, on the voluntary activity and the organization of social solidarity. However, although in these harsh conditions these structures served as bearers of values, including unity and self-sacrifice, they lacked the capacity to create or nurture enthusiasm" (Clark, 2000, p. 128).

In all this effort to respond to an increasingly aggravated situation in the economic, social, political, educational and health plane, we can see that beyond this response, it became and remained "an extraordinary story of a successful self-organization and solidarity" (Clark, 2000, p. 107), which also resulted in the building of a parallel system, which was the forerunner of the state of Kosovo.

From this, we can conclude that without a self-organization at the social plane, life would be made impossible on other planes as well, and thus it would be impossible to preserve survival within the borders of this country. However, the building of such a strategy was a precondition for the safeguarding of the being, and at the same time for the building of the state of Kosovo.

Thanks to this self-organization in the social plane, it was achieved for this form to be extended to other areas such as education and health and thus all the preconditions for survival and the functioning of society were created, even though in an increasingly difficult psychological, social, economic and political environment.

Conclusion:

In the conclusion of this paper, we have a different picture of a reality faced by an entire society, every human right of which was violated, starting from human rights and freedoms, to the right for existence. The emergence of arguments in this context of its confrontations, are only as an introduction to basic studies with confrontations which were inevitable for this society. In the theories of social, political, health, educational self-organization, without any dilemma it remains a unique example, which enriches the all-dimensionality of studies, remaining as it was called in the beginning, a sui generis case.

That entire self-organizing power, united around an individual and collective moral debt towards the union around solidarity and philanthropy, are the foundation of the subsequent developments that generated an extraordinary self-organizing power.
They are a series of actions, which were in full function of preserving the being, dignity and achieving the most human possible goal, freedom.
While they were seen as preconditions to safeguard survival, they also became preconditions for the enlivenment of the state of Kosovo. Its enlivenment would, of course, be put in the function of preserving every human being, regardless of ethnicity, language or religion, becoming a common success story.
The case of Kosovo comes as another and new case, which proves and reaffirms how "Massive non-cooperation and disobedience can bring about changes in the social and political situation, especially the balance of power, during which the dictator's ability to control economic, social and political processes of government and society can get out of control" (Sharp, 2012, p. 49).
And exactly this non-cooperation and this disobedience brought the social changes, which became and remained a precondition of the enlivenment of the state of Kosovo, putting in the right place a human, historical and political right, argued by the decision of the International Court of Justice. Actually, it was precisely the political experience of the parallel state and the civil resistance that were precursors of the status of Kosovo and its sui generis case evaluation. It is not by accident that the International Court of Justice will build its accordance with international law of the unilateral declaration of independence in respect of Kosovo (ICJ, 2010) in close connection with "specific circumstances that make Kosovo a case that is sui generis resulting from the disintegration of former-Yugoslavia, including the historical context of Yugoslavia's violent break-up, as well as the massive violence and repression that took place in Kosovo in the period up to and including 1999 (Weller, 2009).

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Educational gardens

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Abstract

People, especially children and adolescents depend on electronic devices and the Internet. Genuine contact with nature is lost. With the climate crisis, the Covid - 19 pandemic and the challenges posed by social change, awareness of the importance of more harmonious coexistence of man and nature is returning.

Research shows that children are very distant from natural phenomena. The so-called "new ignorance", the absence of direct physical and sensory contact, is spreading.

The thesis aims to shed light on the role of gardens in education. We look at educational gardens from the point of view of pedagogy; we define the importance of experiential learning. Children get acquainted with all the senses with new knowledge in the gardens.

Garden is a concept of different performances. We display the educational types of gardens: botanical gardens, arboretums, school gardens, and private educational gardens.

Educational gardens at various levels of education, from kindergartens, primary schools, secondary schools and beyond, are essential in growing children's and adolescents' personality and emotional competencies and personality traits. Knowledge about gardens is no longer passed from generation to generation. Research on the involvement of pupils and students in gardens confirms good connections between motivation and their achievements in various fields. They also confirm the impact on creativity and critical thinking. With the chapter on the interdisciplinarity of garden pedagogy, we show some practical ways to achieve goals in individual subjects.

Educational gardens are a great help in overcoming the distance of young people from the processes in nature. Experiential learning in gardens reduces the distance from natural processes. All the research results confirmed our hypothesis that gardens are an excellent educational tool. The active participation of children and adolescents in gardens increases their mental, emotional, social and physical growth.

By increasing the involvement of educational gardens in learning processes, it is possible to influence the motivation of young people and block the path of "new ignorance".

Keywords: gardens, education, experiential learning, motivation, new ignorance

1. Introduction

As a person travels through life, his views of the world change, but the values sown in him in his youth remain. Early memories with the spring scent of freshly dug soil in the home garden, crispy red radishes, the chirping of birds high in the canopy of fruit trees, like the velvet caressing petals of a red peony, etc. If you are a child of the twentieth century, you may be familiar with these images. Are they familiar to young people in the 21st century? Certainly not everyone.

People's lifestyles are changing rapidly. We are dependent on electronic devices, powerless without a constant connection to the Internet. Smartphones in children's and adults 'hands are constantly guiding the steps. Nevertheless, we humans are dependent on nature. We feed on what Mother Earth gives. Vegetables, fruits, grains - everything for our body grows in the garden, not in the mall. Furthermore, when, in addition to food for the body, we need food for the soul, we take a deep breath into the intoxicating scent of a rose and realize that we are a living being, a crumb in its entirety.

With the study of literature, we present the facts presented in this field by various experts, especially in the field of education. Based on the analysis of documentation and observation, we continue to implement our own thinking through theoretical knowledge.

Why gardens? After 2010, the so-called "forest pedagogy" began to develop in Slovenia. Like learning gardens, learning in the woods has long been known in our area. However, with the rapid development of digital tools, forests and gardens have become a bit forgotten for some generations.

Maybe the Earth reminded us of them again?

With the climate crisis, environmental pollution, the Covid - 19 pandemic and the challenges posed by social change, awareness of the importance of more harmonious coexistence of man and nature is returning.

The forest is a clearly recognized, defined space in our environment. Experiential learning in the forest is easily accessible, as we are proud of the vast Slovenian forests.

Figure 1: Vegetable garden (photo: Tatjana Perc Nekrep)

We wonder if experiential learning in gardens is also accessible and defined?

We are interested in what educational gardens are and whom they are intended for? People, especially the young, seem to be moving further and further away from genuine contact with nature. This paper aims to show that experiential learning in gardens reduces this distance. We hypothesize that gardens (Figure 1) are an excellent educational tool.

2. New Ignorance

More than three centuries ago, Jean-Jacques Rousseau excited teachers and parents at the time with his reflections on experiential learning. As Emil wrote in his famous work on education: "Teach young people by deeds rather than words" and observe nature and follow its path. (Rousseau, 1959).

Peter Becker, a professor at Philipps University, says a study published in Berlin in 2010 caused a considerable sensation. In a random check of 3,000 students aged twelve to fifteen, only half knew the sun was rising in the east, and many thought permanent milk came from long-lived cows or even bulls. It might be fun to learn that a roe deer is the wife of a deer, that roe deer are called Bambi, that walnuts grow on bushes, that hens lay three eggs a day, and that roses do not bear fruit (Figure 2) (Becker, 2015).

Figure 2: Rose Astronomia between flower and fruit

We do not have studies on how Slovenian children and adolescents answer similar questions. However, today's high school students posed a humorous question posed by the teacher - co-author of this task, was left without the correct answer: "When will the roses that the November cold brought to rest?"

Can we discard young people's answers as irrelevant nonsense, amusing ignorance, or should we, on the other hand, take the causes and possible consequences seriously? There seems to be much evidence that working with nature promotes children's educational process. For educators in general and outdoor educators in particular, it is imperative to consider the recognisable situation that emerges from students 'responses (Becker, 2015).

What indicates children's lack of knowledge is their great distance from phenomena and processes in nature. If they do not know that walnuts grow on trees, they have never seen their fingers turn brown when they pick them. If they do not know that roses bear fruit, they have probably never felt the itching caused by the tiny hairs in the rose hips. That means that cognitive distance is often accompanied by the absence of direct physical and sensory contact. At the same time, we know that children's rooms are dominated by computer screens, mice, game consoles and smartphones. They lead children through a reflection of reality, which always remains only a reflection. The world that enters the spaces of children and adolescents through screens does not need to be explored and understood with the senses of touch, smell, hearing and taste. Neither the autumn storms, nor the spring breeze, nor the sun and snow will leave an impression on the skin. If the basic anthropological assumption is correct that exposure to collisions, friction, encounters and other active contacts is necessary for the advancement of human developmental and educational processes, in modern children's rooms these sensual physical encounters with the world seem to be reduced to cognitive visual (Becker, 2015).

The so-called "new ignorance" that appears in Germany and elsewhere in the world can also be confirmed in Slovenia through experience. Stories from young mouths could be fun if they did not point to their ignorance of what is going on in nature. Primary school children rarely have the opportunity to meet plants and live animals or learn that owls are valuable bearers of knowledge (Figure 3).

Figure 3: Young owls on our tree (photo: Tatjana Perc Nekrep)

In today's world, which on the one hand, is full of abundance for a small proportion of people, and on the other hand, poisoned by mass-produced and chemically processed food, the primary contact with nature and people themselves is being lost. The loss of this genuine contact with nature is most evident in the younger generations. Climbing trees or playing with peers in the yard seems foreign to children. We learn all our lives, but we believe that education and the formation of values are most important in childhood (Levart, 2018).

As an educational, learning garden, as a classroom in nature, the garden makes it easier to understand the learning material, especially science content. At the same time, it allows students to learn about gardening skills and the importance of healthy, garden-grown vegetables, fruits and herbs. Gardening encourages and develops the skills of critical thinking and cross-curricular integration. The latter crucially helps students socialization what they have learned in school as useful for life (Levart, 2018).

In the past, we already had school learning gardens in Slovenia. It is becoming increasingly clear that we all need self-sufficiency knowledge and is generationally missing such knowledge transfer. Schools are centers of knowledge in every community. A sustainable school learning garden can be an actual outdoor classroom for all generations of children and their parents (Nutall, 2016). If ever, then right now, during the Covid-19 pandemic, we need skills and knowledge on how to be self-sufficient, take care of our well-being and preserve nature. That is where sustainable school learning gardens, which combine knowledge, experience, socialization, intergenerational transfers and personal motivation, can help us (Vovk, 2020). At every step, we come across the phrase "sustainable development". But how to live according to the principles of sustainable development if we do not know how to listen to nature? How do you open young people's eyes to see what glitters among the autumn leaves, not just on the screens (Figure 4)?

Figure 4: A frog in the leaves (photo: Tatjana Perc Nekrep)

Education for a healthy environment, sustainable use of natural resources and the content of adaptation to climate change in the local environment - all of the above must be given a central place. Schools have an irreplaceable role in education on sustainable development by raising awareness of the links between society, the economy and the environment (Bricelj, 2021).

3. Educational gardens

Surely each of us has a different idea of what a garden is. Images of gardens are closely intertwined with images of childhood that have left a deep mark on us. This, of course, is not a coincidence, because man is originally connected with nature, which he has always tried to regulate and subjugate at will.

According to some assumptions, the garden is the earliest form of human landscaping, with the garden meant as land fenced with branches or stones to protect against outside afflictions. Historical records show that the garden was originally a tiny, well-kept land on which useful plants were grown and water was used for this purpose. Over time, the garden began to grow into an important addition to the built residence. It went beyond its original, useful - cultivation purpose and became a place for outdoor living (Ogrin, 1993).

Gardens in the distant past showed the way of self-sufficiency of individual communities. With globalization and its problems, the need to establish gardens that enable partial self-sufficiency and activate people to connect (Figure 5), the exchange of experiences, so that gardens have social, environmental, economic and ethical-traditional significance in addition to care, hence sustainable dimensions (Rozman Cafuta, 2018).

Figure 5: Gathering at the garden Nekrep (photo: Matjaž Nekrep Perc)

3.1 Botanical gardens and arboretums: The Botanical Garden is an institution where various plants are planted for study purposes. Botanical gardens play an important role in education, conservation of plant and natural resources and in the field of scientific research. They are also considered a great place for recreation. If environmental ethics and a positive attitude towards environmental conservation could be cultivated through "covert education" when visitors come to botanical gardens, the attitude towards environmental conservation could be significantly improved (Chang, L. S., et al, 2008).

3.2. School gardens: The school garden in today's sense is one of the primary and indispensable teachers in all primary schools, secondary schools and kindergartens. In the past, he was mainly involved in the teaching of biology and agriculture, as well as other science subjects. As a classroom in nature, the school garden can be a connecting element in teaching various subjects (Ribarič, 2014).

Figure 6: Dole training ground, international center for self-sufficiency (photo: Matjaž Nekrep Perc)

3.3. Training ground Dole: Self-sufficiency is becoming increasingly important, which the Institute for the Promotion of Environmental Protection is aware of. Their Dole Self-Sufficiency Training Ground (Figure 6) has just become the International Self-Sufficiency Center. It is led by a scientist prof. ddr. Ana Vovk, who passes on her knowledge to young and older generations through experiential learning. The basic vision of the training ground is the transfer of academic knowledge into practice, with an emphasis on self-sufficiency and a sustainable way of life (oral source: Prof. Dr. Ana Vovk).

Figure 7: Science day for primary school students in the Nekrep garden (photo: Matjaž Nekrep Perc)

3.4 Villa and garden Nekrep: It is an ornamental living garden next to a family villa from the beginning of the 20th century, which covers an area of 6000 m2. The villa and the garden are living units, which also have an educational purpose. In the garden there are occasional meetings of different generations, from school groups with science days (Figure 7), charity - cultural meetings to groups of the University of the Third Age. The basic intentions of the owners are to spread garden culture, preserve nature and architectural heritage, transfer knowledge to young people and connect. The garden is classified as a sensory garden, as all the senses are awakened in it (oral source: T.P. Nekrep).

3.5 E-garden platform: Within the project On the Creative Path to Knowledge (PKP, 11081-6 / 2018), students from three fields came together: architecture, geography and informatics. With the help of pedagogical and work mentors, they explored a part of Slovenian gardens. They created an information web platform (Figure 9) called E-garden: a network of educational and residential gardens (www.evrt.si). In addition to its natural beauty, Slovenia has many interesting built garden environments. The fast pace of living indoors is leading more and more people to search for primacy, to return to natural living. Arboretums, historical and botanical gardens are famous. But there are a multitude of ornamental living, collecting, self-sufficient gardens. Their owners are a rich treasure trove of knowledge. Yet this knowledge is lost in intergenerational transmission. The great educational potential is untapped, and it is necessary to transfer this knowledge to younger generations and the wider community.
The project of the specific goal "Promoting flexible forms of learning and supporting quality career guidance for school-going youth at all levels of the education system" took place in eight phases:
Phase 1: Identification of gardens and development of criteria for educational and residential gardens
Phase 2: Analysis of sample educational and residential gardens according to predetermined criteria (Figure 8)
Phase 3: Designing a common exterior and user features
Phase 4: Design of e-display of individual types of gardens according to the requirements and possibilities of the information platform
Phase 5: Design of an information platform with user functions for the needs of educational and residential gardens
Phase 6: Development of an information platform with pilot examples of educational and residential gardens
Phase 7: Testing the information platform on concrete cases
Phase 8: Promotion of the information platform to the public
The base of Slovenian gardens, which has great educational and tourist potential, has begun to emerge. The information gathered in one place is useful in the educational process at all levels from kindergarten to college. Pupils and teachers will be motivated to visit the gardens in their surroundings, where they will learn experientially what nature can do. (Rozman Cafuta, 2018

Figure 8: E-garden ideas study (sketch: Tatjana Perc Nekrep)

4. Conclusions

In the introduction to the paper, we ask ourselves questions: what educational gardens are, for whom are they intended. We wonder if experiential learning in gardens is accessible and defined? We were interested in what educational gardens are and who they are intended for? Based on theoretical findings and everyday experience, it is clear that people, especially children and adolescents, are becoming increasingly distant from genuine contact with nature. We wanted to show that experiential learning in gardens reduces this distance.

We reviewed the field of educational gardens by reviewing the scientific literature. In recent years, some research has been conducted in Slovenia on the topic of educational gardens, especially in connection with the participation of preschool children in school gardens and the progress of children when visiting the botanical garden. The concept of "new ignorance", which we follow through the task, is already relevant in the field of preschool education. It turned out that preschool children, due to the pace of life and diminishing opportunities for genuine contact with nature, do not have a real idea of plants and nature in general. Research has shown that the active involvement of pre-school children in educational gardens has improved their science knowledge. Research also cites the positive effects of the active involvement of children and adolescents in educational gardens in terms of developing the emotional competencies and personality traits of individuals.

The phrase "educational gardens" is just gaining ground in Slovenia. We found that this is an extremely broad area, which should be given significantly more attention and more specifically included in the curricula of primary and secondary schools. Despite the fact that education takes place not only in school gardens, but also in botanical gardens, arboretums and various private gardens, we believe that the educational garden could be included in general education as a very useful outdoor learning space. Educational gardens are an excellent educational tool that encourages the development of various skills of children and adolescents. They live in an age - the Anthropocene, where technology predominates, and they are actually away from nature. We believe that the curricula could define the content to be addressed in educational gardens and emphasize the interdisciplinarity of different knowledge and sciences. The active participation of children and adolescents in the garden increases their mental, emotional, social and physical growth.

Figure 9: Animals in the garden (illustration: Hana Nekrep)

Gardening activity symbolizes the power of new life emanating from the child.
Let we take an old and new knowledge, let's accept the task of teaching young generations to live responsibly with all living beings (Figure 9). Educational gardens are a wonderful help and a great pleasure

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Determinants of the Average Annual Wage in OECD Countries: An Empirical Analysis for the Period 2011 – 2020

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Abstract

In economics, wages do not present just a cost of production or the price of labor. Wages also mean the source of income that will be used to cover total consumption, and consequently, the level of GDP will be affected. This paper analyzes the possible determinants of the average annual salary. The dependent variable will be the average annual wage, while the independent variables will be productivity, inflation rate, unemployment rate and level of education. Researchers over the years have given different conclusions about the relationship between the level of salary and each of the variables mentioned. The study case includes OECD (Organization for Economic Co-operation and Development) countries during the study period 2011 - 2020. Through this paper we would like to know if any of the factors taken for the study affect the change in the level of the average annual salary and how significant this impact is.

Keywords: wage, OECD
JEL classification: E24, J31

1. Introduction

The study of wage determinants in the aggregate context provides an understanding of how macroeconomic changes affect wage levels. The level of wages varies from one economic system to another. In countries with a command economic system, wages are determined by governments; while in countries with market economic system, the level of wages is determined by supply and demand. Governments, however, set a minimum wage to protect the labour force. Even in the most developed countries, there are still differences in wage levels as a result of racist and gender discrimination. Also, jobs are accompanied by inequality in the treatment of workers, unsafe working environment conditions, lack of health insurance and the informal economy.
Our study focuses on factors such as productivity, inflation rate, unemployment rate and level of education that can possibly affect wage levels. In theory, the level of wages has positive relationship with productivity, inflation and the level of education, and negative relationship with the unemployment rate. The analysis for OECD countries will give findings on the relationships between the variables throughout the study period for these countries.

2. Data and methodology

The data are obtained from the statistical database of the Organization for Economic Cooperation and Development (OECD). The data type is panel data. Variables to be studied include the level of average annual wage (in US dollars), productivity (as percentage change of GDP / hour worked), inflation rate (CPI), unemployment rate and level of education (tertiary education of adults as percentage). We avoided countries that do not have data for all the variables. The data are analyzed based on descriptive statistics, correlation matrix and linear regression model with Fixed Effect estimator.

3. Literature review

Researchers over the years have given different conclusions regarding the determinants of wage level. According to a study, wages tend to be higher for those who have higher levels of education (Clark, 1996). The education level is frequently incorporated in wage scales (Allen & Velden, 2001). The level of education along with work experience also lead to increased wage inequality (Juhn et al., 1993). Paralleling the productivity results, the estimated salary differences for employees with higher education is strongly positive (Hellerstein et al., 1999).
Studies show an increase in the level of education in most OECD countries and the skills that employees bring to their work exceed those required for the job (Harmon et al., 2003). Part of the difference between wages is due to the characteristics of employees

such as work experience and education (Blinder, 1973). Another study states that, supposing wages as constant, satisfaction is decreasing in the level of education (Clark & Oswald, 1995).
The elasticity of real wage to productivity has a positive relationship (Dosi et al., 2020). The results show that higher productivity will lead to higher wages, and this is often reflected at senior workers (Harris & Holmstrom, 1982). ‘‘High-wage firms’’, those that pay above average firm effects, result to have both more productive job forces and higher incomes (Abowd et al., 1999).
In a standard labor market model, unemployment assistance stimulates higher salaries, labor productivity, and may improve overall well-being (Acemoglu, 2001). Some empirical studies have resulted in negative relationship between the level of real wages and the unemployment rate (Peinado & Serrano, 2017).
A tendency for wages and prices to be higher exists in developed countries (Broadberry & Gupta, 2006). In terms of price level, lower prices will result in lower wages (Mincer, 1995). Higher levels of inflation are associated with higher wages. Labor productivity and the extent of democratic rights affect wages to be higher (Rodrik, 1999). Whereas, the findings of another study show that inflation rates affect level of wages in a negative correlation in the case of construction industry in Malaysia (Alaloul et al., 2021).
Deeper, in the links between variables, findings show that the overall prices level has a greater effect on labor productivity than the level of salary. Also, unidirectional causality from salary to productivity implies a broken link between salary and productivity in the case of Turkey (Yildirim, 2015). Through Granger causality and bounds testing approach for cointegration, the effects of inflation on productivity are negative in the case of Malaysia (Tang, 2013). Also, through Granger causality, the findings of another study suggest that real wages and the overall prices level Granger cause productivity in the long run, in the case of Australia (Kumar et al., 2011). The increase of the overall prices level has a positive effect on the unemployment rate. As the minimum wage level has a negative effect on the inflation rate, it will consequently have an indirect negative effect on the unemployment rate, in the case of East Java (Suparta & Murgianto, 2021).
Researchers through the years have shown that wage growth has been an important determinant of inflation, but over time, the relationship between wage level and prices has weakened (Boranova et al., 2019).
Other factors as well show drastic changes in the level of wages, such as: increased returns to university education, changes in industry, a larger percentage of unskilled workers and labor shifts in the informal sector (Attanasio et al., 2003).

4. Findings and discussion

First, we will show the analysis of descriptive statistics for the study variables, in order to see the mean and standard deviation for our observations.

Table 1. Analysis of descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
aaw	350	41883.33	14158.63	16229.92	72465.77
prdct	350	1.323568	2.186061	-7.049243	19.88084
cpi	350	1.518377	1.351683	-1.735902	6.041456
unemp	350	7.594557	4.427703	2.016667	27.49167
edu	341	35.88521	9.835931	14.93537	59.96111

Source: Data processing in STATA by the authors

The table shows that a typical randomly selected country has an average for the average annual wage level of $ 41883.33, with a standard deviation of $ 14158.63, while the number of observations is 350. Productivity has an average annual change of 1.32%, with a standard deviation of 2.18%, while the number of observations is 350. Inflation rate has an average annual change of 1.51%, with a standard deviation of 1.35%, while the number of observations is 350. The unemployment rate has an average of 7.59%, with a standard deviation of 4.42%, while the number of observations is 350. The level of education has an average of 35.88%, with a standard deviation of 9.83%, while the number of observations is 341.

Table 2. Correlation matrix analysis

Variable	aaw	prdct	cpi	unemp	edu
aaw	1.0000				
prdct	-0.1209	1.0000			
cpi	-0.1287	-0.0272	1.0000		
unemp	-0.3006	-0.1224	-0.1591	1.0000	
edu	0.5556	0.1167	-0.2134	-0.2847	1.0000

Source: Data processing in STATA by the authors

According to the correlation analysis, there is a weak negative correlation of -0.1209 between the average annual wage and the level of productivity. The average annual wage is also negatively correlated with the level of inflation and the unemployment rate. Whereas, between the average annual wage and the level of education, there is a moderately positive relationship of 0.5556.

In the following, in order to know the most accurate estimator of our data, the Hausman test is performed. Hausman test consists on two hypotheses:

H_o: The adequate estimator is Random Effects.

H_a: The adequate estimator is Fixed Effects.

Table 3. Hausman test

Variable	(b) fe	(B) re	(b-B) difference	S.E.
lnprdct	.0088073	.0077044	.0011029	.
lncpi	.0022115	.0028848	-.0006733	.
lnunemp	-.0886269	-.0783702	-.0102567	.
lnedu	.3520763	.4081009	-.0560246	.0110801
Prob>chi2 = 0.0001				

Source: Data processing in STATA by the authors

According to the Hausman test, the adequate estimator for the determinants of the average annual wage should be the Fixed Effect estimator, since Hausman test results Prob> chi2 = 0.0001, in which case the null hypothesis is rejected and the alternative hypothesis is accepted.

Table 4. Fixed effects model

lnaaw	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
lnprdct	.0088073	.0038409	2.29	0.023	.0012327	.016382
lncpi	.0022115	.0042773	0.52	0.606	-.0062238	.0106467
lnunemp	-.0886269	.0166611	-5.32	0.000	-.1214838	-.05577
lnedu	.3520763	.0545581	6.45	0.000	.2444835	.4596691
_cons	9.513824	.2158143	44.08	0.000	9.088221	9.939427
sigma_u	.31587538			R-sq:	within	=0.5469
sigma_e	.04799486				between	=0.3574
rho	.97743447				overall	=0.3163
Prob>F	= 0.0000					

Source: Data processing in STATA by the authors

The table shows that the value of t-statistics for the effects of productivity on the level of the average annual wage is t = 2.29, which means that it is statistically significant. The unemployment variable with t = - 5.32 and the education variable with t = 6.45 also appear to be statistically significant. The model has a strength level R^2 = 0.5469, or 54% of the change in the average annual wage level is explained by the changes in the variables included. Prob> F takes the value 0.0000 which means that the model with the simple Fixed Effect estimator should be used for estimates about the effect size.

The marginal effect of the impact is:

- If the productivity level increases by 1%, the average annual wage level will increase by 0.008%.
- If the inflation rate increases by 1%, the average annual wage level will increase by 0.002%.
- If the unemployment rate increases by 1%, the average annual wage level will decrease by 0.08%.
- If the level of education increases by 1%, the average annual wage level will increase by 0.35%.

5. Conclusion

Our study has elaborated an analysis of the determinants of the average annual wage level in the aggregate context. According to the findings, we conclude that productivity, unemployment rate and level of education affect the level of the average annual wage. The results do not prove that the inflation rate is a determinant of the average annual wage level. Further studies with extended observations may yield results that help identify other wage level determinants.

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Resilience of society in disasters caused by nuclear accidents

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Abstract

Keeping in mind that Serbia does not have a nuclear power plant and that there are justified reasons to introduce nuclear energy, it is necessary to examine citizens' level of information and preparedness for such disasters, i.e. the possibility of coping with a specific nuclear accident. Also, several nuclear power plants are in operation near Serbia, so caution and sufficient knowledge should be kept in mind and prevention measures would be implemented in this type of disaster. The research subject is the study of risk perception and preparedness for potential nuclear accidents. The research was conducted on the territory of Belgrade using multi-stage random sampling with 256 respondents. The research results indicate a severe need to inform and educate citizens about risk management in disasters caused by nuclear accidents in Serbia, bearing in mind that the results showed that preparedness is not at a significant level. Based on the research results, preconditions are created to create appropriate strategies, programs, and campaigns that would greatly help improve the awareness and knowledge of citizens about the correct and safe way to react in such situations.

Keywords: disasters, nuclear accidents, society, resilience.

1. Introduction

It is almost paradoxical that there is a positive correlation between social development and risk exposure (Beck, 2016). Although society has been evolving for centuries, favouring ensuring the security of members of social systems, society seems to be increasingly influencing its vulnerability. We first mean the negative anthropogenic factors present in nature, and it is clear that man is their only creator (Quinn, Castéra, & Clément, 2017). Even though it is expected that how society develops and influences all the concurrent processes, which include the development of technology, industry and digital technologies, society increasingly influences its insecurity by causing various disasters (Quinn, Castéra, & Clément, 2017). Not counting natural disasters that cannot be predicted, some occur under the influence of human factors (Gu, 2019). An individual cannot do much to benefit the social environment, but in communion with others, he can. On the other hand, it is expected that one person cannot provide too many negative actions directed towards the environment in which he is, but he certainly can in group action. From that, it can be concluded that even though a person is directed to behave conscientiously towards his surroundings, he does not do what significantly endangers him.

Given that the natural environment is increasingly endangered due to various negative factors (Geras'kin, 2016), knowledge and experience gained through practice and scientific research should be invested that will enable the use of natural energy in an economical way (Dong, Sun, Jiang, & Zeng, 2018), so that pollution or waste of natural resources is reduced as much as possible. For that purpose, we can mention nuclear energy, the use of which has been intriguing for decades and is the subject of negative criticism. First of all, it is no coincidence that atomic energy is so debatable if we consider the disasters that have occurred in the past. Some of the most important and greatest disasters will be listed in this paper. Namely, using nuclear energy reduces the exploitation of natural energy sources through nuclear power plants and increases energy efficiency (Petrescu et al., 2016). So, this type of energy represents a real challenge for scientists and researchers who aim to find an adequate solution for its use. A group of authors has found a way to use more so-called green energy and cause less waste and harmful substances to the environment. Then, it is expected that nuclear power could reduce the emission of harmful gases, especially those that come from the combustion of fossil fuels. If it does not start to be used adequately soon, research warns of the dangers due to the continuation of pollution. (Dong, Sun, Jiang, & Zeng, 2018). Moreover, it is considered that the emission of harmful gases is sometimes positively correlated with the country's economic development, so if the countries develop industrially, they can be more significant polluters of the environment (Dong, Sun, Jiang, & Zeng, 2018).

In addition, research in recent years has focused on developing small modular reactors used for nuclear power generation (Lokhov & Sozoniuk, 2016), but in a much more economical way. This means that there has been a global interest in these reactors, made according to the latest technology. They can be divided into four groups: water-cooled, with gas, with a liquid metal or with molten salt (Ingersoll, 2021). Suppose some of the leading countries globally, such as the United States, China, Russia, Japan and Canada, are working to find the best solution for this reactor. We can assume that its importance is great and that other energy

sources can be reduced. Although there are many positive aspects of the use of nuclear energy (Zhiznin, Timokhov, & Gusevc, 2020), countries are not always ready to develop nuclear power plants for several reasons. First of all, this is a very financially demanding investment, and in addition, there is a fear that has been allayed due to many nuclear accidents that have occurred in recent years (Blasio & Nephew, 2018). For safety reasons, many countries (Germany, Switzerland or Belgium) have decided to reduce or even suspend investments in nuclear research and nuclear power plants (NEI, 2020). The role of atomic energy is undoubtedly indisputable. Still, one should keep in mind the potential dangers it can pose, so it is understandable why many countries have decided to take this step. It is much more favourable to use fossil fuels to produce different types of energy (Radowitz, 2019), and environmental awareness at the global level is not so high, so countries do not think much about the consequences that can be caused (Lee, Markowitz, Howe, Ko, & Leiserowitz, 2015). It is interesting that not every country can invest in developing nuclear power plants and the use of nuclear energy. Still, there are specific principles that it must first meet, i.e. the responsible bodies involved in this process (IAEA, 2020). When it comes to the bodies that participate and are responsible for this process, the following three should be pointed out (IAEA, 2020): the government of the country in which the power plant is being built or invested in nuclear energy; the owner or the body that manages the power plant; the regulatory body responsible for it.

This paper will discuss risk management in disasters caused by nuclear accidents. It cannot be said that nuclear accidents have been frequent throughout history, nor have they always occurred under the influence of the human factor. Still, they have certainly always left far-reaching consequences for the social and natural environment (Geraskin, 2016). Given that nuclear accidents can hurt humans, which will not manifest until years later (Ohtsuru, Tanigawa, Kumagai, Niwa, Takamura, & Midorikawa, 2015), their research and risk assessment is not easy to determine. It is essential to adapt different methods and techniques to manage the given risks in nuclear accidents, considering that they cannot be identified with other accidents (Ravidran, 2017). Atomic energy can be of great importance to man, but if it is not used ethically or in a good way, it can also cause great misfortune for man on an individual level and for humanity. We witness that certain nuclear disasters' consequences are still visible today, even though they happened decades ago. Moreover, estimates suggest that their consequences will be visible for thousands of years (Symonds & Thomas, 2016).

2. Phenomenology of nuclear accidents

The area may have been covered many times, but nuclear disasters are still of interest to many authors (Magill, 2015), so they should not be neglected. If countries decide to test their chances of investing in nuclear energy, they must keep in mind the accidents that may occur, i.e. the causes and consequences of their occurrence (Baraniuk, 2017). The definition of nuclear disasters refers to the following: “A nuclear or radiological emergency is a situation that may arise as a result of an emergency or other unexpected event, human error, equipment failure and other irregularities, including malicious acts involving radiation sources, and require prompt action to mitigate serious adverse effects on human health and radiation and nuclear safety, quality of life, property or the environment, or any hazard that may lead to such serious adverse effects " (Law on Radiation and Nuclear Safety and Security (" Official Gazette of RS ", No. 10/2019) Article 5). So, although the occurrence of nuclear emergencies and disasters due to the action of anthropogenic factors is most often remembered throughout history, this does not have to be the case. One of the world's nuclear disasters occurred due to a natural disaster. On the other hand, as obviously, the world's most famous nuclear disaster is the one that happened in Chornobyl in 1986 and which occurred due to inadequate human equipment management (Ravidran, 2017). Regardless of how the nuclear accident occurred, it is crucial that a person can overcome it if he is sufficiently familiar with risk management in given situations, i.e. the basic rules he needs to cope with an emergency.

It is clear that due to the consequences caused by nuclear disasters in the world, they are becoming a subject of interest and attracting a lot of attention (Ohtsuru, Tanigawa, Kumagai, Niwa, Takamura, & Midorikawa, 2015). Their consequences are visible immediately but also years after they happen. Only some of the effects caused during the accident are the release of large amounts of radiation into the environment, which hurts humans but also the entire biodiversity; melting of the reactor, which causes the release of harmful substances into the air; and others that cause a chain reaction of adverse effects. Nuclear accidents occur due to inadequate reactor treatment in a nuclear power plant (Gu, 2018). It follows from this that the most critical skill is to manage it to ensure the safety of the entire nuclear power plant, i.e. the least possible possibility of an unforeseen situation. The former traditional understanding of the protection of nuclear reactors has been surpassed because there have been many disagreements that arose after atomic accidents in the twentieth century. However, there is no absolute certainty even in the modern understanding of reactor protection. Therefore, the risk of a nuclear accident always exists and arises due to the incident. What is new in current reactor safety is faster detection of reactor failures or any warning that something is not working correctly (Gu, 2018).

It is impossible to talk about the consequences of nuclear accidents or repair them if the attention is not focused on the reasons for their occurrence (Bendix, 2019). As stated several times during the work, the main reasons these disasters disappear are technical-technological, i.e., improper management of power plants by people or through natural disasters that will cause a malfunction or accident. The last major disaster due to natural factors was in Fukushima in 2011 (Aghakouchak, 2018), and its consequences have been the most studied in recent times. After this disaster, experts had more severe fun with the functioning of the reactor and the possibility of repairing faults as soon as signs of them appeared (Rose & Sweeting, 2016). This study aims to calculate the rate of failure of reactors. Namely, in 2016, there were 443 reactors globally, of which the United States owned the most significant percentage. Based on previous accidents and the scale of international nuclear events, they concluded that this country has the most excellent chance of a nuclear accident occurring in its territory in the next 25 years. Also, this does mean major nuclear disasters and minor reactor failures that destabilise the operation of the power plant. When it comes to countries with nuclear reactors, official data show that the United States still leads in the number of nuclear reactors. It can be concluded that they invest the most in developing and using nuclear energy (Statista, 2021) after they are France with 57 reactors, which is not a tiny number compared to America, especially China, which has fewer as a much more extensive and more populous country. It could also be the result of accidents in Japan, which have led them to think about the dangers that atomic and nuclear energy can cause. What can be concluded

based on this chart is that the level of economic development of the country is not positively correlated with investment in nuclear energy. This is argued that, for example, Sweden or Germany, as highly developed countries, do not have a large number of nuclear reactors (Statista, 2021).

One of the important reasons nuclear accidents can occur is natural disasters (Aghakouchak, 2018). The conditions in which humanity lives today depend on their treatment of the natural environment. There have been fires or floods due to global warming in the last few years. In addition, unforeseen disasters such as earthquakes or tsunamis occur. One such natural disaster has caused the Fukushima nuclear accident (IAEA, 2016). The Director-General wrote an International Atomic Energy Agency report that clearly states that this accident was caused by a tsunami followed by a strong earthquake. In the introductory word, it is mentioned that this was the most significant nuclear accident after Chornobyl in 1986. The number of people evacuated after this accident exceeded 100,000, and some have not returned to their homes. What stands out, in particular, is the actions of the staff during the disaster and during the repair of its consequences, which will be explained in more detail later during the work. The report also confirms that there were obvious difficulties in the operation of this power plant before the accident. As a result of the information, all other countries that own nuclear power plants were ordered to additionally test their reactors and work on them as a precautionary measure, which was done.

3. Prevention of nuclear accidents

Immediately after the nuclear accident in Japan, an emergency was announced, which included activities for the general public, starting with the rapid evacuation of people (IAEA, 2016). Knowing the consequences that could happen to the population, the state and its organs soon began to implement measures to mitigate the effects. Some of the critical dangers are the following that will be discussed (Ravidran, 2017). The greatest threat is radiation that cannot be seen or felt; it is not noticeable. These consequences can occur in different ways, both for the person and his entire environment. They happen in the first 60 days if it is an acute exposure, which means that the person was exposed to radiation to a considerable extent. If there are no critical consequences, the next ones are postponed according to the level of reaction, followed by late/late, and finally, chronic or genetic consequences of radiation (Jorga, 2016). The general public has reason to be frightened about the effects of radiation because they are inevitable in some form when a nuclear accident breaks out. Radiation poisoning or other types of pathology can occur after the human body is exposed to these rays (Jorga, 2016). They damage cells and cause cancer, and can even lead to death. Also, they hurt people, but the consequences also affect the earth, i.e. all other living beings (Geraskin, 2016). Namely, if plants and animals are exposed to radiation, it can cause entire chain reactions in the ecosystem and disrupt its basic functioning. Much radiation will be absorbed depending on the degree of radiation plants or animals have been exposed to or irradiated. Then, they can show anomalies of different types in a certain period. On the other hand, there is a possibility that animals or plants will not be modified if radiation exposure is treated adequately, i.e. if these disasters are successfully managed (Geraskin, 2016). Integrated use of knowledge and research data obtained from studying similar topics is crucial for coping in these situations. We are exposed to a certain level of radiation daily (Zeegers et al., 2017), but it is not a significant source of danger. However, there are methods to examine this level of exposure. For these consequences of radiation caused by high radiation levels, the World Health Organization states that it causes burns and radiation diseases visible on the skin (Jorga, 2016). The consequences are also visible in the possibility of developing cancers of various types and other conditions. The effects of radiation are felt by organs such as bone marrow, skin, gametes, cartilage and mucous membranes. In external contamination, radiation is introduced through the consumption of food, water or in contact with other elements from the external environment (Jorga, 2016). As already mentioned, radiation is dangerous because the human senses cannot identify it. Also, radiation manifests depending on the dose and source of radiation. You can get skin burns or skin cancer, worsening the blood picture, reduced vision or reduced quality of lung cells. If we are too exposed to the sun's ultraviolet rays, we can get skin cancer and a decrease in blood leukocytes, which further causes adverse effects on other systems in the body (Einstein & Hill, 2016). These are just some of the symptoms; many others depend on the type of radiation. The primary way for a person to manage the risk of radiation exposure is to detect it first. There are devices for measuring radiation levels that warn a person about radiation status to know what to do accordingly.

There are different levels of radiation exposure after the Chornobyl disaster and the consequences that can be caused after it (BBC, 2019). It was noticed that the workers who were the first to take part in repairing the damage due to the outbreak of the disaster were exposed to the most significant radiation. After that, some were not exposed to the same extent, but certainly, their radiation is not negligible and leaves consequences. The consequences are listed here in the form of vomiting, internal bleeding or death within just two weeks. So, as in the previous case, it is about acute radiation. Interestingly, regardless of the scale of the accident in Fukushima that occurred in 2011, employed workers were many times less exposed to dangerous radiation than in Chernobyl (BBC, 2019). We can assume that this is due to mistakes learned from the past and the use of more modern protective equipment. The data on the maximum level of radiation to which employees at nuclear plants are allowed to be exposed is also essential (BBC, 2019). This is followed by stories of radiation that are not dangerous to human life and do not cause significant consequences. There is also a difference between the exclusion zones due to the Chornobyl radiation and the Fukushima disaster.

Preventive measures are necessary and indicate excellent opportunities for successful remediation of consequences (Ravidran, 2017). The example in Fukushima is a witness to the fact that if expert groups and special units are ready to act in similar situations, the consequences can be remedied relatively quickly, certainly much faster than those created at Chornobyl (NEI, 2019). The importance of applying preventive measures lies in the fact that these situations do not happen. If they do, reduce their adverse effects, which are undoubtedly harmful to humans and the environment, as much as possible (Hadleigh-Dunn, Labib, & Agwu, 2019). This leads us to conclude that regardless of whether a country has had a case of nuclear disaster, it must have a ready plan of reaction and organisation in case an accident occurs. Probably taught by experience from previous natural disasters and precisely the Chornobyl nuclear disaster, Japan has responded very successfully to this challenge and shown a difference in skilful risk

management, as evidenced by the enormous difference in the number of victims (Bendix, 2019). Emergency management requires some prior knowledge, which facilitates dealing with them promptly and with as minor damage as possible (Ravidran, 2017). Even when society encounters disasters for the first time, training and education must be held beforehand and at least practical experiences based on simulated situations to make the reaction in real cases more credible (Ohba, Tanigawa, & Liutsko, 2021). The genuine part will consist of an overview of applicable prevention measures at the individual and community level in a nuclear accident. It has already been mentioned that people must have at least some basic knowledge of engaging during emergencies. Given that any natural or technical-technological disaster can happen anytime and anywhere, it only contributes to the importance of providing essential training to the civilian population (Cvetković, Jakovljević, Gačić, & Filipović, 2017). Also, in areas at potential risk of a nuclear disaster, special attention should be paid to training in the field of emergencies caused by nuclear accidents.

For example, it is essential to know how to handle devices that measure radiation levels, especially for people who are relatively close to nuclear facilities. Then they will know what level of radiation they faced and what should be done about it (Ravidran, 2017). Then, it is not out of place to learn the allowed level of radiation a person can be exposed to in everyday life or at some periodic level. In order not to go into details that are not the subject of this paper, it is essential to mention that devices we use every day, such as mobile phones, microwaves, radios, and other technical devices, do not pose any danger to us (Symonds & Thomas, 2016). On the other hand, radiation through medical equipment in treating some diseases can be harmful. There is a rule that after a few hours, the radiation level drops. If we have provided ourselves with adequate shelter from nuclear accidents or radiation in general, and if we stay in it for more than seven hours, we can reduce the consequences (Ravidran, 2017). More detailed preventive measures will be explained in the next few lines through a particular classification into actions that can be implemented by an individual and standards that the community should carry out by the orders received from the competent authorities.

People often do not know how to protect themselves, so they should be educated on many levels to save themselves and other people in unforeseen situations. When it comes to nuclear accidents, it is essential to know a few fundamental rules that anyone can apply (Ravidran, 2017): the level of radiation decreases over time. After several hours of radiation, it falls. This does not mean that the environment is safe after a few hours, but it does mean that it is less contaminated, and it is also necessary to provide particular shelter in the form of protection. It is considered essential to hide underground for this type of protection. So any kind of basement can be helpful; then, it is necessary to stay away from windows or other openings in the house or shelter because the radiation spreads through the air and through radiation, which means that rarely any material has adequate protection against it; if possible, protect yourself with some more substantial and more massive objects. This means that at no cost should you go out into the open and be exposed to radiation, but close yourself inside thicker and more massive walls or materials.

It is necessary to point out that a person cannot be ready to react quickly after the outbreak of a nuclear accident if he is not trained or educated at least about the basic things that are necessary for the realisation of these types of emergencies (Nomura et al., 2016). For this reason, it is essential to educate people in potentially endangered areas around nuclear facilities. The entire population must know at least some basics in repairing the consequences of any disasters and unforeseen circumstances. Still, those living near nuclear power plants should consider the possibility of an accident. In this regard, the competent authorities must educate the population in the endangered zones in various ways and organise practical training activities or the application of preventive measures (Tsujiguchi et al., 2019). The authorities must adequately identify the basic needs and act on them. This means that the available resources for emergencies should be directed toward repairing their consequences; therefore, it is pretty logical that a significant part of the funds must be directed toward the health system (Kaur, 2020). It is also essential that staff working in health, safety and similar services in endangered areas to ensure the safety and health of the population be trained to deal with patients in the event of a nuclear accident. Given that radiation exposure differs significantly compared to some injuries due to other natural disasters, vulnerable patients require special care, which, among other things, poses a danger to the staff itself, given that they are in contact with the patient who was exposed to high levels of radiation (Jorga, 2016). One of the essential tasks of managing the risks of disasters caused by nuclear accidents is the training and willingness of staff to respond to these challenges (Kenan & Jovanović, 2015). It is essential to pay special attention to the team working in the security services, at nuclear facilities and in health care institutions. Case studies and studies have been conducted to examine the extent to which personnel are genuinely prepared to face a type of emergency and how much they can be counted on when it comes to saving lives and providing first aid in a nuclear accident (Tsujiguchi et al., 2019). The next part will describe some research that dealt with the training of experts and staff and readiness to work in given emergencies.

Nuclear safety and security are essential for work at a nuclear plant; however, it turns out that there are fewer and fewer experts in this field lately, so this problem should be solved given that the need for them is growing (Kenan & Jovanović, 2015). The fact is that nuclear accidents do not happen often, but that is not a reason to neglect staff training and risk management strategies. Far from it, considering that these disasters leave far-reaching consequences, serious training should be taken about the movement of people who will manage emergencies. With that in mind, a group of researchers at the University of Pennsylvania and several other colleges in the United States are conducting timely courses and training on nuclear safety and emergency response in a nuclear disaster. This training aims to train as many experts as possible in this field, i.e. to attract personnel who will deal with nuclear safety. Also, it is no coincidence that these courses take place in this country because it has the most significant number of nuclear reactors and invests the most in atomic energy (Statista, 2020). The US Department of State and the Global Threat Reduction Initiative have found a way to form groups of experts who will pass on their knowledge and desire to deal with nuclear security to young people. The loss of technical and professional support in this sector is unacceptable, so it is essential to compensate quickly. The number of experts in this field is decreasing, and young students have lost interest in nuclear safety. The focus of these professional training, which these two organisations and universities across America are holding, is to create a scientific climate that will nurture the importance of nuclear safety. Interestingly, this brings together cooperation at the international level, emphasising American atomic security and global security. The courses that participants can attend are divided into several classifications depending on their interest in nuclear energy (Kenan & Jovanović, 2015): international nuclear safety policy;

detectors and source technology; application of detectors, sensors and sources for radiation detection and measurement of radioactivity; nuclear safety laboratory; risk and threat analysis and assessment; design and analysis of security systems for nuclear and radiological facilities.

3. Influence of demographic, socio-economic and psychological factors on risk perception

It should be pointed out that risks are all around us and that they follow us every day, whatever we do in life. Individuals are exposed to risk every day, whether it is some business situation or examples of another kind (Türkkan & Hırca, 2021). In some cases, individuals enter risky positions because they create a unique feeling of excitement and increase their adrenaline (Sund, Svensson, & Andersson, 2017). However, we must not lose sight of situations that individuals cannot influence or that they do not choose to have. As can be concluded, these situations are riddled with natural disasters, and people cannot control them but must react by their readiness and information. There is a lot of research done on the influence of socio-economic, demographic and psychological factors on the perception of risk in disasters of various kinds, some of which will be mentioned in the paper. Of course, this is primarily about hazards that not only people do not choose but also occur relatively rarely, such as floods, fires, strong winds, technical and technological disasters and more (Sjöberg, 2000).

Knowing how individuals react to unforeseen disasters and their perception of risk is essential for a security policy to see if they can respond in case of need. In addition, a distinction needs to be made as to how they view risk at the individual level, focusing on themselves and how they see a risky situation that can be devastating for other community members, that is, for the whole society (source). For example, a study studied the perception of risk from the aspect of an individual who views the risk situation as a potential danger to him. He is personally endangered and scared for his life. In this study, the risk is considered subjective because it relates directly to the individual (Sjöberg, 2000). As mentioned, there are significant studies on the study of risk perception. Therefore, a category of studies examines the personal perception of risk by individuals who often overestimate low-risk risks, i.e. underestimate high-probability risks (sources). Then, some studies aimed to investigate how different factors affect belief and knowledge about risk (source). Of course, when we talk about aspects, we think first of sociological, psychological and demographic factors. For example, scientists have studied how individuals experience different dangers ranging from climate change, floods, fires, nuclear disasters, fear of nuclear waste and more (source). Also, there is even a categorisation of risks into the following three (Olofsson & Öhman, 2015): known; controlled; fear of danger.

Counting on the need to examine the information and readiness of citizens to react in case of technical and technological disasters with a focus on nuclear accidents, we can assume that there is some difference in socio-economic, demographic or psychological factors on risk perception. So, depending on which socioeconomic factors affect individuals, their perception of risk will be different. Socioeconomic characteristics can often play a decisive role in risk behaviour and perception (Martinez-Arias, Prades, Arranz, & Macías, 2000). For example, the population living in territories often affected by natural disasters is mainly accustomed to these phenomena, which means that they can be ready for an adequate reaction compared to citizens who do not often encounter natural disasters (Cvetković, 2018). As can be concluded, the reason for this lies in the fact that citizens who are accustomed to disasters are taught how the system works and are ready to take various measures that they have already learned. In this regard, they are better acquainted with what should be done in given situations and how to respect the signs of the warning system in shared dangers (Cvetković, 2016). We should not forget that certain risks cannot be prevented, nor can measures be implemented to eliminate them (Cvetković, 2016). What is essential is that the citizens are better informed about the preventive measures that they can implement if they want to repair and reduce the occurrence of negative consequences. Suppose they are better acquainted with preventative measures and the essential information they need to know about specific disasters. In that case, they will find it easier to overcome their challenges. In addition, people who have already gone through some kind of disaster or similar trust the media that report on the accident and are more willing to respond to this challenge than citizens who have not had the opportunity to face a disaster (Cvetković, 2016). This happens because there is a fear that the accident will happen again; their experience makes people feel more ready to react to an accident. On the other hand, there is an opportunity for citizens who have never survived a disaster to show readiness to respond in such situations, even though they have not had the chance to learn the measures that need to be implemented (Cvetković, 2016).

Socio-economic determinants, demographic, psychological and other factors have been examined regarding risk perception. It can be concluded that there is a difference when these factors are compared with a particular risk (Sund, Svensson, & Andersson, 2017). These three characteristics contain several different but interrelated elements that can affect an individual's behaviour in disasters, risk perception, implementation of preventive measures or similar (Cvetković, 2016). We will first pay attention to demographic factors, and later we will focus on socio-economic and psychological ones. Regarding demographic characteristics, we include the following (Cvetković, 2016): gender, age, level of education, and success in high school. Also, regarding demographic determinants, research has revealed different results in terms of risk perception in terms of gender, age, level of education and others. For example, it has been investigated that women perceive risks as more significant and more dangerous than men (Sund, Svensson, & Andersson, 2017). Specifically, these cases involve risks such as floods, fires, theft, air accidents, car accidents and health risks. We cannot say the reason for these results, nor will we link them to the characteristics of women and men, but we will keep in mind that men view risks with less fear than women (Sund, Svensson, & Andersson, 2017). Then, women also consider situations such as violence and crime, technical-technological disasters, and environmental disasters riskier than men (Barke, Jenkins-Smith, & Slovic, 1997). Interestingly, the significance of these results varies by territory. For example, in the United States, women must view risks as more dangerous and more significant, while in Sweden, the classification of risks by gender is less critical (Sund, Svensson, & Andersson, 2017).

In addition to gender, many other demographic characteristics can affect risk perception, such as age. One study found a negative correlation between age and risk perception of air accidents, fires, or car accidents (Savage, 1993). So, it is considered here that

older people have less fear of the above accidents. On the other hand, young people are more afraid of fires, car accidents, etc. Furthermore, when it comes to health risks, a positive correlation has been observed; for example, older people are more afraid of cancer than younger people (Lazo, Kinnell, & Fisher, 2000). Also, older people perceive the risks of nuclear waste or nuclear disasters as much higher and more dangerous than youth (Andersson & Lundborg, 2007). Speaking of demographic characteristics, we should not neglect the level of education. Namely, studies have found a difference in risk perception depending on education (Sund, Svensson, & Andersson, 2017). Of course, education should not be seen as a precondition for different perceptions of risk, but we could link it to greater awareness of disasters and accidents that may occur. In this regard, highly educated people may be more aware of the risks, i.e. situations that can cause different types of accidents and deal with them (Sundblad, Biel, & Gärling, 2007). One study found that people with lower levels of education are less aware of the dangers that a disaster can cause and do not view the risks as extremely dangerous (Sundblad, Biel, & Gärling, 2007). In addition to these, some studies have not seen a link between different levels of education and risk perception, i.e. fear of certain disasters (Andersson & Lundborg, 2007). Namely, the studies mainly dealt with the perception of the risk of natural disasters such as floods, earthquakes, hurricanes or strong winds, and the so-called everyday risks such as fire (Knuth et al., 2015). In these studies, fire is declared an everyday risk, primarily because it can occur in a household where people live every day. Of course, this does not mean that fires resulting from natural disasters are excluded from other research studies. After demographic characteristics, it is essential to pay attention to socio-economic factors that may affect risk perception. In this regard, we can mention the following (Cvetković, 2016): employment; the amount of income of the individual; marital status.

Employment and the amount of an individual's income can be linked in several ways because we assume that someone who is employed is at the same time financially independent. Research has shown that people who have higher monthly incomes believe that they can more easily bear the risk of disaster to overcome the negative consequences of the same (Kostyuchenko & Movchan, 2015). Then, when it comes to fire risk perception, a study shows that employed people are more willing to take specific preventive measures than the unemployed (Cvetković, 2016). Let's build on employment and the ability of citizens to take particular actions to either repair the consequences of disasters or take preventive measures. We can judge that households with higher incomes have more significant opportunities to take specific steps (Cvetković, 2016). On the other hand, citizens whose gains are much more modest and, in some cases, even insufficient, are not able to use their resources in the same way to protect themselves from the consequences of natural or other disasters (Cvetković, 2016). Also, citizens who pay for an insurance policy have a relatively low perception of the severity of the risk of some natural disasters (Xu et al., 2019). In addition, they believe that if they are financially independent, i.e. if they have enough income, property and insurance, they will be able to bear the consequences of the disaster and its negative effect on their family more easily. This is why their perception of risk hazards is relatively low (Xu et al., 2019). Low-income populations perceive natural and other disasters as high-risk situations to which they will not be able to respond quickly (Kostyuchenko & Movchan, 2015). Interestingly, social networks and acquaintances influence their perception of risk regarding financial readiness for them. In this regard, we cite the importance of the ability of households to borrow money or other resources from their friends, relatives or acquaintances in the event of the need to remedy the negative consequences of a disaster (Xu et al., 2019). For example, households in rural areas and rural families have a more comprehensive network of friends they can count on to lend them money in case of need. Unlike urban homes, rural households are less prone to purchasing natural disaster insurance policies (Xu et al., 2019). However, rural families with higher incomes have shown interest in insurance against natural disasters. Concerns that an accident may occur and a high chance of losing what they have gained through their work lead household members to ensure their properties (Cao, Xu, Xie, Liu, & Liu, 2016).

After demographic and socio-economic factors, it is time to explain the psychological determinants that can affect the perception of the risk of natural and other types of disasters. Psychological factors include the following (Cvetković, 2016): fear of a particular disaster; previous experience with similar situations; risk perception; motivation to react in a certain way. All psychological factors are interrelated, so it is no coincidence that individuals may feel fear of disaster if they have had previous experiences with similar situations (Knuth et al., 2015). In psychological factors, the study of fear of natural and other disasters is widespread, and studies indicate relatively different results. For example, a study conducted in 2015 in the Republic of Serbia confirmed that out of 2,500 respondents, almost half of them feel fear, about 30% do not feel fear, while about 16% of citizens are not sure whether they feel fear of natural disasters caused by floods (Cvetković & Sandić, 2006). The study results also show a close relationship between fear of floods and gender, age, education, marital status, employment status, monthly income and other demographic and socio-economic characteristics (Cvetković & Sandić, 2006). Then, the same study showed that employed citizens fear natural disasters, which can be related to their information and training to react in given situations, and are aware of the dangers that can follow after natural disasters of different kinds (Cvetković & Sandić, 2006).

Natural disasters and how they cause consequences of a psychological nature can be seen in the appearance of anxiety, depression or post-traumatic stress (Novia, Hariyanti, & Yuliatun, 2020). These psychological consequences can cause fear and the above disorders and many other products reflected in frequent mood swings, decreased interest and motivation for some activities, etc. Natural disasters are significant provocateurs of human mental disorders (Niitsu, Takaoka, & Uemura, 2014); moreover, if the psychological problems of people caused by natural disasters are not resolved in a short period, there is a distinct possibility that people will fall into complex mental states (Niitsu, Takaoka, & Uemura, 2014). People who have survived some type of disaster and suffer from post-traumatic stress usually show symptoms such as recurrence of this event while constantly avoiding the potential next occurrence of the disaster (Briere & Elliott, 2000). Suppose post-traumatic stress is not resolved in time. In that case, there is a high possibility that people may fall into a depression that can be cured with regular visits to a psychotherapist and appropriate medications (Bravo, Rubio-Stipec, Canino, Woodbury, & Ribera, 1990). Beyond these symptoms, individuals may develop a sense of guilt that they justify by being guilty of not reacting in time or not being ready enough to face a given situation. This problem is present because the victim cannot overcome the pain he is currently dealing with; he cannot continue with his life so far, nor does

he want to forget what happened. Of course, such reactions are related to large-scale disasters in which the individual or his close people were directly affected (Briere & Elliott, 2000).

We should not forget the interdependence of psychological factors with others that we talked about a moment ago. This statement shows the relationship between fear of natural disasters and the population's place of residence or occupation (Novia, Hariyanti, & Yuliatun, 2020). So, for example, people engaged in agriculture have an intense fear of drought or floods, which can endanger their yield and their lives directly and the lives of their families. In addition to this, people generally face the fear of a specific disaster and the consequences that may be caused (Briere & Elliott, 2000). Post-traumatic stress disorder is just one of the psychological consequences of a disaster. In addition, trauma may develop in survivors of the accident, which may take some time to overcome (Andersson & Lundborg, 2007). People who have witnessed in any way the natural devastation that has caused any kind of death, suffering, injury, loss of property, material destruction, loss of shelter and other accidents will indeed feel some form of psychological problem that must be resolved as soon as possible (Novia, Hariyanti, & Yuliatun, 2020). Shortly afterwards, post-traumatic stress disorder may occur months or even years after the situation that caused or provoked it (Bravo, Rubio-Stipec, Canino, Woodbury, & Ribera, 1990). The stress that the victim experiences results from the trauma she experienced due to a disaster and all the consequences have to do with it. Trauma is a condition in which the victim participates psychological, but her situation is accompanied by psychological difficulties and experiences that make her feel vulnerable and unstable (Carlson, 1997). After suffering a natural disaster, some cases exhibited forms of behaviour that were not previously part of their standard behaviour patterns (Elliott, 1997). For example, if a person has survived a disaster, he may fear not having clean water or drinking water for a long time after it, fear destroying a shelter, or fear losing loved ones. Then, he may feel uncertainty, maladaptation to suffering, and unable to perform his daily tasks (Elliott, 1997). This fear does not disappear when a person changes the environment in which the accident happened but follows him for a while wherever he is.

4. Methods

The general hypothesis of this paper is that there is a strong agreement of respondents with the view that they are not sufficiently informed about the management of disaster risk caused by nuclear disasters. The population of the sample consists of all adult citizens of Belgrade. The research was conducted on the territory of Belgrade using multimethod random sampling. After the settlement and the street, every other household on the left and right sides of the road was selected by the mentioned method. Every male and female citizen who turned more than eighteen according to the principle of next birthday was surveyed. The sample included 256 respondents. Regarding the explicit goal, it is important to note how the respondents' socio-economic, demographic, and gender characteristics can influence the reaction in the event of a nuclear disaster. There is also a tendency to examine how these characteristics affect the level of basic information about nuclear disasters and their possible consequences. The survey questionnaire was formulated based on previously established goals and research ideas, and the inspiration was obtained based on reviews of many scientific studies and research that had the same or similar topics of interest. Before conducting the research, a pilot research was conducted on only a few respondents to check the comprehensibility and clarity of the question before contacting the respondents with the survey questionnaire. This reduces the possibility of survey error or misunderstanding of the question and the concept of the questionnaire.

Sample

The total number of respondents is 256, and the sample included 109 men and 147 women, which is a percentage of 42.58% of men and 57.42% of women. The age group most included in the sample is 49-58 years old, whose number of respondents is 114, or 44.53%. The next group of respondents with 53 persons was aged 29-38, then there were 47 respondents aged 18-28, and finally, 42 respondents aged 39-48. The sample included the most respondents (80) with higher education, i.e. 70 with higher education, 69 with a four-year secondary school and 37 with a three-year secondary school. Also, when it comes to marital status, the most significant number of respondents is married (167), above 65%, followed by a group of respondents who are engaged (37) 14.45%, in a relationship (44) 17.19%, followed by respondents who are divorced (5) 1.95% and those who are unmarried (3), i.e. 1.17%. When it comes to household size, the largest share of respondents lives in a household with a total of three members (89) 33.59%, then in a household with four members (68) 22.56%, then in a household with five members (46) 17, 97% and finally in a household with one member (35) 13.67%, ie with two members (21) 8.2%. In terms of monthly income, the largest share of respondents has more than 90,000 dinars available on a monthly basis (123) or 48.05%, followed by a group of respondents with monthly cash income between 50,000-75,000 (92) 35.94%, then a group of respondents with a monthly income of 25,000-50,000 (33) 12.89%, and finally respondents who receive between 75,000-90,000 RSD (8) 3.13% per month. More than 64.84% of respondents are employed, while 35.16% are unemployed. The occupations of the respondents were also examined. Most of the respondents fall into the group of professions of service or trade (68) 26.56%, followed by administrative officials (62) 24.22%, followed by artisans with related occupations (46) 17.97 %. Technicians or associate experts (42) 16.41%, then there are managers (35) 13.67%, and finally technicians and associate experts (3) 1.17% (Table 1).

Table 1. Sample structure (N = 256).

Variable	Categories	N	%
Gender	Male	109	42.58
	Female	147	57.4
Age	18-28	47	18.36
	29-38	53	20.70
	39-48	42	16.41
	49-58	114	44.53
Education level	High education	80	31.25
	Higher education	70	27.34
	Three-year high school	37	14.45
	Four-year high school	69	26.95
Marital status	Engage	37	14.45
	Unmarried	3	1.17
	Divorced	5	1.95
	In a relationship	44	17.19
	Married	167	65.23
Household size	Household with two members	21	8.20
	Household with one member	35	13.67
	Household with five members		
	Household with three members	46	17.97
	The household has four members	86	33.59
Income level	25.000-50.000	33	12.89
	50.000-75.000	92	35.94
	75.000-90.000	8	3.13
	More than 90.000	123	48.05
Employment	Employed	166	64.84
	Unemployed	90	35.16
Number of employed members in the household	2	210	75.27
	3	46	24.73

5. Results

Bearing in mind that one of the essential goals of the research is to examine the readiness to manage the risks caused by nuclear disasters, the first question that respondents face is their willingness to take relevant measures if they find themselves in a given situation. Namely, when asked if they think they would know what steps to take if they find themselves in a nuclear disaster situation, the majority of respondents, 51.17%, answered that they would not manage, and 28.91% responded that they do not know. The rest, 19.92%, answered that they would work. More than half of the respondents do not think they would manage in case of a nuclear disaster, 29% do not know if they would work, i.e. 20% of them believe that they would operate in a situation of the outbreak of nuclear disaster. The next question referred to their perception of their willingness to help others in the event of a nuclear disaster. The majority of respondents answered this question; as many as 75.78% of respondents answered in the affirmative, i.e. 18.19% of them responded that they did not know, and only 7.03% of them answered that they were not able to help others. Counting on the fact that the important goal of this research is to examine whether respondents are ready and sufficiently trained to react in the event of a nuclear disaster, they point out the following: 73.44% of respondents say they do not think they are ready to respond in case of nuclear disasters, i.e. 26.56% of them believe it is prepared. The upcoming question is whether the respondents believe that they are sufficiently aware of the consequences of the nuclear disaster. The following answers were given to the question: 30.86% of respondents said they thought they were adequately aware of the effects of a nuclear disaster. In comparison, the remaining 69.14% said they did not know they were sufficiently aware of the consequences of a nuclear disaster. There was a tendency to examine the fear among the people regarding the possibility of a nuclear disaster. A percentage of 41.41% of respondents state that they are afraid, while 58.59% are not afraid that there could be a nuclear accident in their environment. We cannot determine the specific reason for the respondents' answers. Still, we can assume that many respondents answered that they are not afraid of a nuclear disaster in their environment, primarily because of the city of Belgrade and the Republic of Serbia. There is no nuclear power plant. When asked whether respondents would be ready for an emergency evacuation in a nuclear disaster, the following answers were given: 56.25% of respondents said they were prepared to evacuate in a nuclear disaster. In comparison, 43.75% said they were not ready or thought it was necessary.

The upcoming question refers to the volunteering of respondents in the event of a nuclear disaster. When asked if they are ready to volunteer in their country in a technical-technological disaster, all respondents answered in the affirmative. On the other hand, the question was whether they would volunteer in a neighbouring country in the event of a technical-technological disaster, respondents provided the following answers: 80.86% of respondents answered that they would volunteer, 17.97% do not know whether to volunteer, and all 1.17% of respondents indicated that they would not volunteer. When asked whether they would comply with all measures adopted by the state in the event of a technical-technological disaster, respondents gave the following answers:

73.44% of respondents said they would abide by state measures, 26.56% of respondents do not know whether to comply with standards and none of the respondents stated that they would not comply with the criteria prescribed by the state. The next question refers to the need of the respondents to receive primary or additional education on the issue of disaster risk management caused by nuclear accidents. Accordingly, 56.25% point out that they think there is a need for this primary or additional education, while 43.75% do not believe it is needed. Building on the previous question, there was a tendency to check whether the respondents would attend any training on managing the risks of disasters caused by nuclear disasters. Therefore, 59.76% of respondents answered that they would listen to education, while 40.24% would not listen to education on disaster risk management caused by nuclear accidents.

When it comes to the opinion that respondents know much more about managing the risk of disasters caused by nuclear accidents than others, respondents gave the following answers: 37.11% of respondents stated that they do not agree with the given position, 17.18% of them do not agree nor does he disagree with this view, 27.73% of respondents agree with this view, 17.98% of them disagree at all, while no respondent stated that he entirely agrees. Regarding the attitude "I would know how to cope in the event of a nuclear disaster", the respondents give the following answers: 23.44% of them disagree, 19.14% of them are neutral, i.e. neither agree nor disagree, 40.23% of respondents agree, 17.19% of them disagree at all, while none of the respondents stated that they completely agree. There was a need to examine awareness and opinion about the danger of a nuclear disaster. In this regard, with the attitude that the nuclear disaster is not as dangerous as others say, 35.54% of respondents state that they do not agree with this view, 44 neither agree nor disagree, 26.56% of them agree, 20, 7% of respondents do not agree at all, and there are no respondents who fully agree with this view. Another position on examining the awareness of the danger of a nuclear disaster is stated, which points out that a nuclear disaster can be more dangerous than a natural disaster. 17.18% of respondents disagree with this view, 44.53% neither agree nor disagree, 30.08% of respondents agree, 8.21% of them agree, while no respondent disagrees with a given attitude.

It was also necessary to examine whether the respondents would have confidence in the competent authorities to respond to a nuclear disaster's dangers adequately. Accordingly, 17.58% of respondents disagree that they trust the competent authorities to respond to the risks of nuclear disaster adequately, 13.67% neither agree nor disagree with this view, 24.22% agree, and 44.53% agree fully agrees. In contrast, no respondent agrees at all with this view. It remains to be examined how much the respondents are interested in attending courses and training on managing risks caused by nuclear disasters. Therefore, as many as 40% of respondents disagree with the need to organise training courses for responding to nuclear disasters, 1% disagree or disagree, 35% agree, and 24% fully agree. At the same time, no respondent completely disagrees. With the attitude that people in the area are not aware of the consequences of a nuclear disaster, 17% of respondents neither agree nor disagree, 28% of respondents agree, and 55% of respondents agree.

Crossing the level of education and the respondents' answers to whether they think they would know what measures to take in case of a nuclear disaster, we get the results shown in Table 2. Insight into it, we can conclude that 14.8% of highly educated people would not manage, 10.2% do not know if they would work, and 10.2% think they would care. People with higher education mostly believe that they would not manage, i.e. 76% of them would not mind, while the minority feels they would work or do not know. When it comes to respondents in high school, for the most part, a neutral answer is provided, i.e. respondents do not know what measures they should take in the event of a nuclear disaster. People with a four-year school are divided between a positive and a negative answer, while respondents with a three-year school answer "I don't know" or not to cope. Also, no one said they would manage. The results of research that testify to the connection between the level of education and the question of whether the respondents would know what measures to take if they find themselves in a nuclear disaster situation indicate that there is a statistically significant correlation between the given variables $p = 0.16$. The results of cross-tabulation of gender and questions on whether they think they can help others in a nuclear disaster are shown in Table 4, both in percentage and absolute about the total number of respondents surveyed. More than 80% of females answered in the affirmative; no person said they did not know, while less than 20% thought they could not help others. When it comes to men, a higher percentage answered positively, while three times fewer males claim they do not know. Looking at the bigger picture, 75.8% of the total number of respondents responded positively, and 17.2% answered: "I don't know". In comparison, only 7% of respondents answered negatively to the question, and this 7% are exclusively female.

The results of research that testify to the relationship between gender and whether they are ready to help others in a nuclear disaster indicate a statistically significant relationship between the given variables $p = 0.43$. As the alpha value (α) is equal to 0.05, we conclude that the null hypothesis is rejected. The null hypothesis states no statistically significant correlation, i.e. dependence between the observed features. The results of the cross-tabulation of education levels and whether they consider themselves sufficiently trained to react in the event of a nuclear disaster can be seen in Table 6. Higher education respondents in, 7.5% stated that they believe 24% do not think they are trained enough to react in a nuclear disaster. Also, when it comes to higher education respondents, about 4% of them believe that they are sufficiently trained, while about 23% of them do not think so. Then, according to the respondents who have completed three years of high school, 14.5% of them state that they do not consider themselves sufficiently trained to react in a nuclear disaster. Regarding respondents who have completed a four-year high school, about 15% state that they consider themselves sufficiently trained, while 12% believe they are not adequately prepared. The research results, which testify to the connection between the level of education and whether they consider themselves sufficiently trained to react in a nuclear disaster, indicate a statistically significant correlation between the given variables $p = 0.4$. As the alpha value equals 0.05, we conclude that the null hypothesis is rejected. The null hypothesis states no statistically significant correlation, i.e. dependence between the observed features.

Male and female respondents are completely divided when answering whether they think they are sufficiently aware of the consequences of a nuclear disaster. As 42.6% of respondents are women, so is the same percentage who answered that they do not think they are sufficiently aware of the consequences. On the other hand, all-male respondents, 57.4% of whom responded positively to the question. The results of research that testify to the relationship between gender and whether they believe that they are

sufficiently familiar with the consequences of a nuclear disaster indicate a statistically significant relationship between the given variables p = 0.42. As the alpha value (α) is equal to 0.05, we conclude that the null hypothesis is rejected. The null hypothesis states no statistically significant correlation, i.e. dependence between the observed features. The results of cross-tabulation of education levels and whether they are afraid that a nuclear disaster could occur in their environment can be seen in Table 10. About 7% of higher education respondents said they feared a potential nuclear disaster. In comparison, about 24% said not to be afraid. Also, when it comes to respondents who have completed three years of high school, 14% point out that they are worried, while 27% of respondents with four years of high school say that they are not afraid.

The results of the cross-tabulation of occupations and whether they consider it necessary to receive basic or additional training in managing the risk of disasters caused by nuclear accidents are shown in Table 12. Based on the results, it can be seen that employed workers express the greatest need to receive additional education on the issue of managing the risks of disasters caused by nuclear accidents (26.6%). Low rates are defined by technicians or associates (1.2%) and administrative staff (7%), while medium rates are expressed by experts and artists (16.4%), artisans (18%) and managers (13.7%). The research results, which testify to the connection between household size and the question of whether they are ready for emergency evacuation in the event of a nuclear disaster, indicate that there is a statistically significant correlation between the given variables p = 0.50. As the alpha value equals 0.05, we conclude that the null hypothesis is rejected. The null hypothesis states no statistically significant correlation, i.e. dependence between the observed features. The results show that 43.7% of respondents answered that they think it is unnecessary when asked if they would be ready for an emergency evacuation in a nuclear disaster. Most of them are people whose household has four members and, to a lesser extent, people whose household consists of three members. More than 50% of respondents answered that they are ready to evacuate in the event of a nuclear accident, where people living in five-member households are in the lead in this section, followed by people in three-member and one-member households. People in three-member households are divided into an almost perfect relationship. Respondents living in households with one, two and five members answered exclusively in the affirmative.

Looking at the respondents' answers, according to their level of education, to whether, if they were able, they would listen to education on the topic of disaster risk management caused by nuclear accidents, it can be seen that there are variations. There are twice as many highly educated people who would not listen as highly educated people who would listen; on the other hand, people with higher education respond more positively, while only less than 15% of people with this level of education give a negative answer. People who own a three-year school reacted positively, and those who have a four-year high school are divided, but a more significant number would not listen to education. Given different genders, there are noticeable differences in whether they would volunteer in an outbreak of a technical-technological disaster in a neighbouring country. All male respondents responded positively, while more than 50% of female respondents answered thoroughly. A tiny percentage of women responded negatively, while just over 40% said they did not know if they would volunteer in a neighbouring country.

The research results, which testify to the connection between household size and the question of whether they are ready for emergency evacuation in the event of a nuclear disaster, indicate that there is a statistically significant correlation between the given variables, p = 0.36. As the alpha value (α) is equal to 0.05, we conclude that the null hypothesis is rejected. The null hypothesis states no statistically significant correlation, i.e. dependence between the observed features. To the question: "Do you think you are sufficiently aware of the consequences of the nuclear disaster?" Respondents who are employed and unemployed on average answered equally. Based on the ANOVA analysis, at the 95% security level, we conclude that the employed and the unemployed do not give equal answers to the previously asked question on average.

5. Discussion

The research brought significant results and indicators in managing risks caused by nuclear disasters. Based on the critical data surveyed, 51% of respondents believe they would not know what measures to take in a nuclear disaster. These data indicate a need for additional education and training on disaster risk management caused by technical and technological disasters, focusing on nuclear accidents. In support of this data, it was noted that the respondents are ready for additional education on disaster risk management and to attend a lecture on responding to situations caused by technical and technological disasters. This finding is similar to data obtained from similar studies (Trajano, 2019). First of all, there was a tendency to investigate how well the respondents were informed about the consequences and ways of reacting to nuclear disasters, i.e. whether they thought they would cope in the given situations. As a result, it was reported that respondents felt that they were not sufficiently informed on this issue. In further work, it is concluded that highly educated respondents, to a greater extent, imply that a nuclear disaster can be more dangerous than a natural one. This data can be compared with the research conducted, and it is related to a similar topic that concerns the protection, control and prevention of nuclear disasters (Ravidran, 2017). Then, respondents over the age of 39 expressed high agreement with the view that mandatory training courses should be organised to respond to nuclear disasters. Furthermore, the level of income of the respondents does not determine their need for additional education about the management of the risks caused by nuclear disasters. In this regard, respondents of different income levels are ready to receive further education and training. Also, women showed greater fear of the dangers of a nuclear disaster.

When it comes to the attitude that they have confidence in the competent authorities that can adequately respond to the dangers of nuclear disaster, about 23% of respondents said they agree. It is essential to ensure the confidence of respondents and society in general in the competent institutions and measures. The state would eventually prescribe. For comparison, after the outbreak of the nuclear disaster in Japan, the Government of Japan introduced rapid evacuation and various types of activities that the emergency implies. In this regard, the society showed great obedience to the institutions there, which required strict adherence to measures to mitigate the consequences of the nuclear disaster (Ravidran, 2017). An analysis of the response to the Fukushima nuclear disaster showed that locations near the nuclear power plant reacted urgently at the community and individual level (Nomura et al., 2016),

which greatly affected the smaller number of victims (Bendix, 2019). The very fact that a person cannot be ready to react quickly if he is not trained enough is a great challenge to work on education, providing basic information about responding to and repairing the consequences of a nuclear disaster (Ravidran, 2017). In this case, people need to be trained in disaster risk management caused by nuclear disasters, especially if they are in endangered places (Tsujiguchi et al., 2019). Given that many countries today invest in nuclear energy and that one part of the paper shows how many atomic reactors exist in European countries, it is almost imperative to train people on the potential dangers and consequences of nuclear disasters so that in the event they can adequately to react. We assume that each state will take adequate measures to repair the effects of the disaster. Still, the individual must know on an individual level what needs to be done in the first reaction to minimise damage to him and his immediate environment (Ravidran, 2017). Given that our research showed that a large percentage of respondents (76%) believe that they can help others, it is necessary to support this result with a real test in the form of lectures, training and possible workshops that would give people a closer picture of risk management from disasters caused by nuclear disasters.

In addition to the respondents, it is essential to train employees in various related positions who would eventually find themselves in the first stroke of assisting in nuclear disaster response (Kenan & Jovanović, 2015). A study aimed to examine how much security students at the University of Pennsylvania are informed about nuclear safety. The main goal of this training was to train a growing number of researchers and experts on basic and more detailed information on nuclear disasters and their response to them to increase the number of personnel dealing with nuclear safety (Kenan & Jovanović, 2015). The lack of experts in this field is very worrying, which becomes even more problematic if people are not aware of the dangers of a nuclear disaster daily, nor would they know how to react to it if it occurs. Therefore, cooperation at the global level is gained by investing in measures to protect against nuclear disasters. Interestingly, there is an apparent disagreement with the view that the nuclear disaster is not as dangerous as others say, as evidenced by about 36% of respondents disagree with this. Some studies indicate that low radiation levels can be harmless to humans or their environment, supporting these data. However, respondents still express fear and precautions that would guide them in a given situation. The greatest fear arises due to the possibility of developing different types of cancer or other diseases (Symonds & Thomas, 2016). On the other hand, there is evidence that only 1% of radiation comes from the nuclear industry, while all the rest is from our everyday environment (Symonds & Thomas, 2016). Additional research indicates that there is a great fear that the consequences caused by a nuclear accident are permanent and that they cannot be easily remedied, especially when it comes to human physical health (Ohtsuru, Tanigawa, Kumagai, Niwa, Takamura, & Midorikawa, 2015). Of course, a distinction should be made between the regular use of nuclear energy and the outbreak of a nuclear disaster that causes much more far-reaching consequences (Renn, 2016). More than 55% of the respondents fear that the people around them are not aware of the effects of a nuclear disaster, which is not negligible. This fear is not unjustified if we take into account the fact that man's immediate and immediate environment may indeed be endangered due to the outbreak of a nuclear disaster in the sense that its habitat and basic foodstuffs may be contaminated and disabled (Tsujiguchi, Chieko Itak, Kitaya, Shiroma, & Kashiwakura, 2018).

The fact is that there is a need for people to have basic knowledge on the issue of engagement and response in emergencies (Cvetković, Jakovljević, Gačić, & Filipović, 2017). More care needs to be taken for potentially exposed areas to technical and technological disasters. Our research showed that 37% of respondents do not think they know much about managing the risk of tragedies caused by nuclear accidents. About 60% of them would listen to education on risk management of disasters caused by nuclear accidents. This information can be taken as a starting point for the future organisation of additional education, seminars and other activities where you can learn more about how to cope, react and take essential measures in a nuclear disaster. Some research aimed to examine the readiness of the respondents to protect themselves in the event of a nuclear disaster and to check how much the respondents are ready to develop a culture of nuclear safety and security (Trajano, 2019). The data of the mentioned research can be compared with the results of this master's work insofar as there are precise data that the respondents do not think they are sufficiently trained or ready to react to in case of a nuclear disaster. In this regard, the results of this research can be used to improve the risk management of nuclear disasters.

4. Conclusions

The research contributes significantly to this scientific field, considering the smaller number of such studies in Serbia. It is essential to keep in mind that the research was conducted on the territory of Belgrade, where nuclear energy is not currently used. Still, in relatively recent history, there was a situation when the Republic of Serbia was exposed to the consequences of a nuclear disaster indirectly. Also, several nuclear power plants are operating near the country, so caution and sufficient knowledge should be kept in mind and prevention measures would be implemented in this type of disaster. Based on that, there was a need to examine the social strata on efforts to respond to, prevent and inform about the dangers of nuclear disasters. The research part first aimed to investigate how many people think they are ready and told about reacting to situations caused by nuclear disasters, i.e. whether they consider themselves sufficiently trained and whether they perceive the danger of given conditions. As already mentioned in the last part of the paper, it turns out that the respondents feel that they are not ready enough to react in these situations and that they express a desire and need to be further educated on this issue. Then, it is essential to know that a large percentage of respondents are willing to respect the measures taken by the state in the event of an outbreak of this unforeseen situation and to agree or fully agree with the view that they trust the authorities and institutions to respond to dangers nuclear disasters adequately. They are also ready for a possible evacuation and assistance in the form of volunteering in the event of a nuclear disaster. This research could further support similar topics to improve nuclear disaster risk management practices. Then, there is space and possibility to expand the scope of this research and obtain even more detailed results and data on information and training of the population on the consequences of nuclear disasters and ways to better protect themselves from them. It is essential to know at least basic knowledge, protection and prevention measures in responding to technical and technological disasters, bearing in mind that they are not uncommon and that the consequences can indeed be devastating. In addition, as the need of the respondents to receive additional education was noticed,

it is not out of place to use this mood regarding the culture of nuclear protection and safety. When it comes to the limitations and difficulties of this research, the fact is that the research was conducted in the territory of the city of Belgrade and not in the territory of the Republic of Serbia as a whole.

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THE IMPACT OF IMPORT AND EXPORT ON THE ECONOMIC GROWTH OF OECD COUNTRIES (2014-2020)

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Abstract

Purpose: This scientific paper aims to analyze the impact of exports and imports on the economic growth of OECD countries. The econometric model aims to verify the links between the dependent variable that is economic growth and the independent variables that are imports and exports.
Methodology: For the realization of this work, secondary, quantitative data are used, based on the annual data collected and published on the official website of the OECD, as well as data from the World Bank, within a certain period, where these data show the relationship that exists between exports, imports and economic growth. This paper covers a period of 7 years for 36 different OECD member countries. As a main objective we will have the analysis of positive and negative factors that affect the increase or decrease of imports and exports to these countries and then their direct impact on economic growth.
Findings: Based on the empirical results, we can conclude that exports have a positive impact on economic growth, but not imports which have a negative impact. All independent variables in relation to dependent variables are evaluated with standard significance level P-value = 0.05. However, in the long run, our results revealed that domestic investment and exports have a positive effect on economic growth but not imports.

Keywords: Imports, exports, economic growth, OECD countries

1. Introduction

This paper addresses the role of exports and imports in economic development. Theoretical and empirical studies conducted by various researchers focus mainly on the relationship between export and growth, import and growth, or the association between export, import and economic growth. Exports of goods and services are seen as the engine of economic and social development for a number of reasons.

First, the paper investigates the direction of causality between trade variables and productivity growth. The results show that imports, not exports, are a significant determinant of productivity. Moreover, the beneficial impact of imports stems not only from competitive pressures coming from the import of consumer goods, but also from technological transfers embodied in imports of capital goods from developed countries.

Many economists see export-driven growth strategy as the cornerstone of economic recovery. Exports contribute to growth by facilitating labor mobilization and capital accumulation. Exports and export promotion policies are beneficial in the adoption of technologies, which improve the productivity of exporting firms and the economy in general, thus accelerating economic growth. Moreover, many studies provide empirical support for the export-driven growth hypothesis showing that exports have a significant positive effect on productivity and economic growth.

If a country imports more than it exports, it has a trade deficit. If you import less than you export, this creates a trade surplus. When a country has a trade deficit, it has to borrow from other countries to pay for additional imports. It's like a house just starting out. A country should not continue to borrow to finance its trade deficit. At some point, a mature economy should become a net exporter. At that point, a trade surplus is healthier than a deficit.

By definition, exports are a function of international trade where goods produced in one country are shipped to another country for sale or trade in the future. Exports are an essential component of a country's economy, as the sale of such goods increases the country's overall output. And most of the largest companies operating in advanced economies derive a significant portion of their annual revenue from exports to other countries. One of the essential functions of diplomacy and foreign policy between governments is to promote economic trade, encouraging exports and imports for the benefit of all trading partners (Amadeo, 2019).

Exports and imports can play a crucial role in economic development. Theoretical and empirical studies conducted by various researchers focus mainly on the relationship between exports and growth, imports and growth, or the association between exports, imports and economic growth. Some economists argue that firms tend to learn advanced technology through imports and must adopt it to compete in the foreign market. Furthermore, expanding output from exports reduces unit prices, thus increasing productivity.

2. Literature Review

Exports and imports can have a crucial role in economic development. Theoretical and empirical studies conducted by various researchers focus mainly on the relationship between exports and growth, imports and growth, or the association between exports, imports and economic growth. Some economists argue that firms tend to learn advanced technology through imports and must adopt it to compete in the foreign market. Moreover, expanding output from exports reduces unit prices, thus increasing productivity.

The study of the relationship between exports, imports and economic growth shows an existence of bilateral demand, the cause between economic growth and imports, exports and economic growth and exports and imports. Increasing productivity improves a country's international competitiveness in price and quality, and therefore increases its exports. Economic growth is not driven only by exports but rather, a mixture of exports and imports, where the latter have a long-term impact (Andrews, 2015).

The export-driven growth hypothesis assumes that export growth is one of the key indicators of economic growth. There is a reaction effect between export-production-growth and growth-production-import. In the long run, the level of revenues significantly affects imports. The effect of capital imports on economic growth will depend on the extent to which growth is constrained by a lack of capital. Demand for imports is mainly explained by real GDP. There is a positive relationship between imports and economic growth. However, the direction of the impact between imports and economic growth is less certain, this is because the direction of causality seems to predominate mainly from revenues to imports at quarterly frequencies, and not vice versa (Hussain, 2015).

Ramos (2001) researched the issue between exports, imports and economic growth in Portugal during the period 1865-1998. The empirical results of this study did not confirm a one-sided causality between the variables considered. There is a feedback effect between export-output growth and export-export growth.

Bouoiyour (2003) included currency integration and Granger-causality tests to examine the relationship between trade and economic growth in Morocco for the period 1960-2000 using the VEC model. Empirical results of the study show that exports and imports enter the currency equation with positive signs. The results show that a test for Granger causality concluded that GDP growth causes export growth, that there are higher export reactions to a change in GDP.

Fullerton (2012) Investigated the relationship between exports, imports and economic growth in Mexico for the period 1980-2007, using causal proof methods and vector error correction methods. Thus, these results show that imports play a more critical role than exports to economic growth in Mexico. Engle (1987), stated that a unified system can be represented in an error correction structure which includes both changes and levels of variables, so that all elements are stationary. The results show that there is a short-term bilateral causality between exports and GDP growth for developing countries. In an open economy, countries are focused on improving the quality of life of their citizens, and quality of life is an indicator of economic development.

Balassa (1985) examined the relationship between exports and economic growth. The results showed that exports, revenues and relative prices are integrated. This has proven that there is a bilateral causality between exports and revenue growth. Finally, the results show that export promotion policy contributes to economic growth. The findings show that there is a unitary relationship between GDP and the import of other goods.

Kotan (1999) incorporated two specifications of different model in estimate a function of import demand for Turkey. Thus, it has been concluded that in the long run, the level of revenues significantly affects imports. He also examined the effect of capital imports on savings and growth for less developed countries. He found that the effect of capital imports on economic growth would depend on the extent to which growth is constrained by a lack of capital. Similarly, Asafu-Adjaye (1999), they also found evidence that production, export and import were co-integrated inland in oriented countries. Using the error correction models, they found causality by moving indirectly, namely, from exports to imports and then real output. In summary according to all the findings, it is clear that imports are important towards the channel of economic growth

3. Methodology and Specification of the Econometric Model

This paper will analyze the impact of exports and imports on economic growth of 36 OECD member countries which are: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, United Kingdom, Mexico, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, USA, Turkey, Netherlands, Switzerland and Zealand young. The impact of these variables will be analyzed for a 7-year period from 2014-2020. For the realization of this work, we will work with secondary data that are obtained mainly from the official website of the World Bank and the OECD, as well as from the literature of various authors.

Our econometric model will look like this:

Y(GDP) = b0 + b1X1 (export) + b2X2 (import) + e.
Y- dependent variable
X1- independent variable (export).
X2- independent variable (import).
βo- parameter or zero constant which indicates how much the value of Y will be when X is constant (X = 0)
β1- the regression parameter which indicates how much the unit will change Y when X changes by one unit.

e - is the error term which includes all variables which are not taken into account in the model and which may have affected that model.
In this econometric model as a dependent variable (Y) we have economic growth (GDP), while as independent variables we have export and import. During this research we will try to collect all the data of these variables for each of the above-mentioned states in order to reach the right answer about this paper. After researching the analysis that was done by other authors, we noticed some limitations in terms of economic growth as an economic indicator that represents the market value of all material goods and services produced within a country in a period certain time.
An independent variable which affects the economic growth of a country is export (X1) which represents goods and services produced in one country and purchased by residents of another country. During this research we will prove what impact this variable has on economic growth. While the other independent variable which affects the economic growth and the impact of which we will prove also is the import (X2) which represents a good or service brought to one country from another. The word "import" is derived from the word "port" as goods are often shipped to foreign countries. Together with exports, imports form the backbone of international trade.

4. Study Results and Findings

In the following tables we have presented the relationship between the dependent variable and the independent variables.

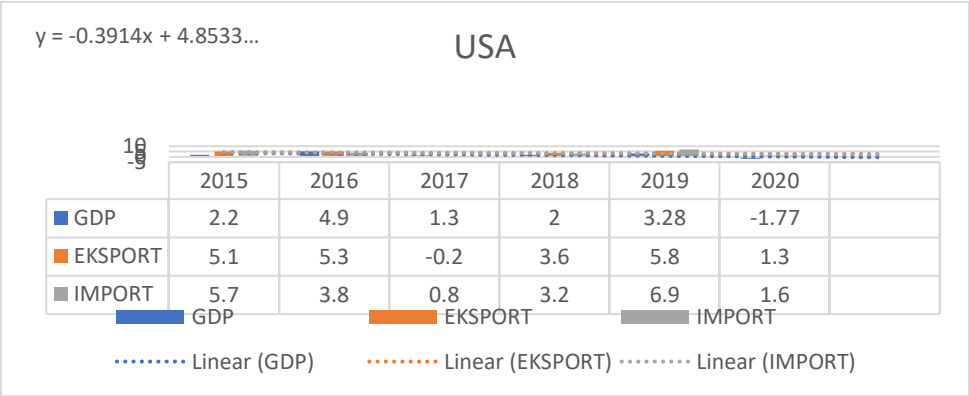
Table 4.1. *Descriptive Statistics*

Descriptive Statistics

	Mean	Std. Deviation	N
Rritja ekonomike	2.353	2.4196	252
Eksporti	54.281	35.7230	252
Importi	50.592	30.0249	252

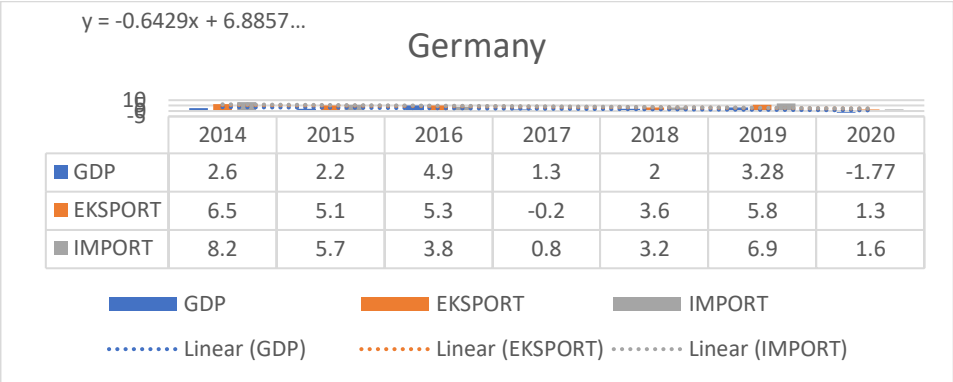
From the 252 data that we have analyzed we have managed to derive the description of statistics and from these data we can conclude that the average economic growth (GDP) is 2.353 with a standard deviation of GDP of these countries of 2.4196 units. The average and standard deviation with higher values than the other variables is export with an average of 54,281 and standard deviation 35.7230 while the average import is 50,592 and with standard deviation 30.0249 units.
The charts and tables below present data on economic growth, exports and imports in percentage for Germany, USA and Luxembourg for 7 years.

Chart 4.1. *The USA*



Unlike almost every other nation to rank among the richest in the world, the US does not rely much on exports. The total value of exports of goods and services from the US is equal to only 12.1% of GDP and have the highest level of income inequality. If we are based on the obtained graph, we see that there is a negative trade balance, since in all the years analyzed the percentage of imports is even higher than that of exports. Based on the table we see that export values are very close to the average cumulative trend of 12.73% with very small movements above this average in 2014 2015 and 2016 thus falling from 2017 to 2018.

Chart 4.2. Germany

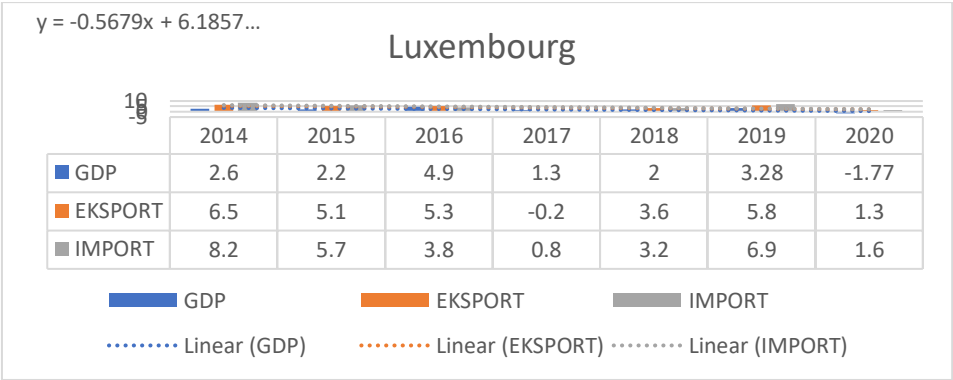


Germany has the largest national economy in Europe. Germany's economy held strong enough during the first years of the crisis, and economists say its strong performance has helped peripheral countries. (Breidthardt, 2013). It took her several years to keep the level of GDP stable where even from the graph presentation we see that in the first 2 years analyzed there was a lower percentage of economic growth while after 2016 there was a rate of GDP growth in year to the average cumulative trend calculated by the Excel program for the analyzed years which has a value of 1.56%, except in 2020 there was a decrease in GDP of 1.5%. Germany's ability to recover strongly is seen as crucial to Europe's hopes of emerging from four years of debt crisis and recession.

Based on the graph presentation we see that there is a stable rate of export of products to the average trend of 46.25%. In 2017 and 2018 Germany was ranked the third largest exporter in the world for goods and services. Exports account for 41% of national production. Also, imports have had very small changes to the Cumulative Average Trend of 39.24% where we see that almost every year there has been the same percentage of imported products, except in 2020 where we see that there has been a greater increase in imports of goods with worth 1.287 trillion US dollars from around the world. From the graphic presentation as well as the values in the table we see that Germany has a positive trade balance sepsed in all the years analyzed the value of exports has been higher than imports.

The majority of 64.3% of Germany's total imports are satisfied by European countries. Asian trading partners sell 22.1% of Germany products while 13.6% of goods originate from North America, Africa, Latin America and Australia.

Chart 4.3. Luxembourg



The reason why we decided to analyze Luxembourg was because we were impressed by the high values of exports and imports compared to other countries and this happens for several different reasons. Luxembourg has about 600,000 inhabitants, but with a GDP of $ 66 billion (estimated for 2016) at $ 110,000 per capita, they enjoy the highest per capita gross domestic product in the world ranking as the richest country in the EU and one of the richest in the world. Based on the data obtained in the Excel program we see a fluctuation of GDP values at the beginning of the analyzed years because in 2009, as a result of the global economic crisis a budget deficit of 5% resulted from government measures to stimulate economy, especially the banking sector and we see that this deficit has taken positive values over the years.

Luxembourg's economy is mainly based on exports. In 2020 it reached a value of $ 16.2 billion from exports and represent 25.2% of its total Gross Domestic Product. In the analyzed years we see that the highest value of exports has reached after 2016, thus continuing with the same growth rate of exported products, a trend higher than the Average Cumulative Trend calculated with a program that has a value of 207.57%. Also, Luxembourg like Germany has a positive trade balance because in all the years analyzed the value of exports has been higher than imports according to the graph built by the Excel program.

Table 4.2. Descriptive table layout

Descriptives

			Statistic	Std. Error
Economic Growth	Mean		2.353	.1524
	95% Confidence Interval for Mean	Loëer Bound	2.053	
		Upper Bound	2.653	
	5% Trimmed Mean		2.296	
	Median		2.300	
	Variance		5.855	
	Std. Deviation		2.4196	
	Minimum		-7.3	
	Maximum		25.2	
	Range		32.5	
	Interquartile Range		1.8	
	Skeëness		3.137	.153
	Kurtosis		32.175	.306

Based on the Descriptive table we notice in some data have where the curvature coefficient is 3.137 / 0.153 = 20.5032 (since this value is not found within the range -1.96 and +1.96 we say that the data are not distributed close to normal). Whereas the kurtosis coefficient = 32.175 / 0.306 = 105.147 (since this value is not found within the interval -1.96 and +1.96 we say that the data are also not distributed close to normal and the positive value of the coefficient shows that the curve is not printed but straight to normal.

Table 4.3. *The Normality test table*

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Ëilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Economic Growth	.125	252	.000	.771	252	.000

Since the number of data is greater than 29 we will use the Kolmogrov-Smirnov normality test. The hypotheses of this test are formulated as follows:

H0 - data distribution follows normal distribution,

H1 - data distribution does not follow normal distribution.

Sig <0.05 H0 is rejected and H1 is accepted and vice versa. Since 0.000 <0.05 then H1 is accepted which means that the data distribution does not follow the normal distribution.

Table 4.4. Presentation of the normality test table

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Loëer Bound	Upper Bound
1	(Constant)	1.993	.330		6.030	.000	1.342	2.643

Eksporti	.078	.030	1.154	2.645	.009	.020	.136
Importi	-.077	.035	-.952	-2.182	.030	-.146	-.007

Linear regression equation:
Y (economic growth) = 1.993 + 0.078 (exports) - 0.077 (imports) + 0.93
e = 100% - R = 100% - 6.3 = 93.7% or 0.937
b0 - if exports and imports remain constant then GDP will be 1,993 units. This statement is correct because the significance level is less than 0.05 (0.000 < 0.05).
b1 - if exports increase by one unit keeping imports constant, then GDP will increase by 0.078. This statement is correct because the significance level is less than 0.05 (0.009 <0.05).
b2 - if imports increase by one unit keeping exports constant, then GDP will decrease by 0.077 units. This statement is correct because the significance level is less than 0.05 (0.030 < 0.05).

Table.4.5. Presentation of Model Summary and Correlations tables

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Ëatson
1	.250[a]	.063	.055	2.3522	1.252

Correlations

		Economic Growth	Export	Import
Pearson Correlation	**Economic Growth**	**1.000**	**.211**	**.190**
	Export	**.211**	**1.000**	**.990**
	Import	**.190**	**.990**	**1.000**
Sig. (1-tailed)	**Economic Growth**	**.**	**.000**	**.001**
	Export	**.000**	**.**	**.000**
	Import	**.001**	**.000**	**.**
N	**Economic Growth**	**252**	**252**	**252**
	Export	**252**	**252**	**252**
	Import	**252**	**252**	**252**

In the Model Summary table, we can analyze the correlation coefficient, determination, standard error and autocorrelation based on Durbin-Watson.
The correlation coefficient has a value of 25.0% which shows a very weak correlation between the dependent variable (economic growth) and the independent variables (export and import). If we are based on the Correlations table, we also notice what correlation these variables have. Exports have a positive correlation in the value of 21.1% which shows a very weak relationship between exports and economic growth, so as exports increase, so does GDP. We also notice that imports have a positive correlation in the value of 19.0% which shows a very weak relationship between imports and economic growth, so with the increase of imports the GDP also increases. Whereas, the coefficient of determination has the value of 6.3% which shows a very poor degree of explainability between the values of the dependent variable (economic growth) and the independent variables (export and import). So for 6.3% exports and imports explain economic growth.

Autocorrelation through the coefficient Durbin Watson has its preferred values from 1.5 - 2.5, therefore the coefficient values for our model is 1.252 which shows that this econometric model is not preferable and has positive autocorrelation, and this error that the standard error of the coefficient b is small. The error term has the value 93.7% where this value indicates the impact of all other variables which are not taken into account which models in the model and indicates that this econometric has a very poor degree of explanability (2 = 6.3). and the value of the error term is a very high value. The value of standard parameter errors are: $\mathbf{b_0}$ = 0.330, $\mathbf{b_1}$ = 0.030, $\mathbf{b_2}$ = 0.035 and **e** = 2.3522.

Multicollinearity: Based on the coefficients table we can also find out if there is multicollinearity between variables and we understand this by calculating this way: Sig. X1 = 0.009 <0.05 no collinear relationship Sig. X2 = 0.030 <0.05 no collinear relationship Therefore in our econometric model we do not have multicollinearity. Heteroskedasticity: Through the formal Park Test method we will analyze heteroskedasticity. **Lne2 = bo + b1lnX1 + b2lnX2 + .t**.

Table.4.6. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Loëer Bound	Upper Bound
1	(Constant)	-2.465	1.234		-1.997	.047	-4.895	-.034
	lnX1	.385	1.698	.090	.227	.821	-2.959	3.728
	lnX2	.162	1.873	.034	.086	.931	-3.528	3.851

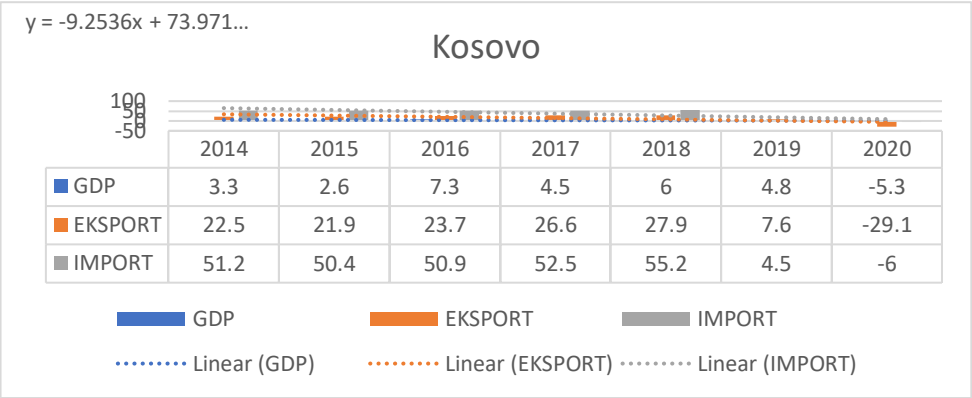
a. Dependent Variable: lnE2

	Significance/ P-value
LnX1	0.821 > 0.05
LnX2	0.931 > 0.05

Based on the Park test results we can conclude that this econometric model has no presence of heteroskedasticity. Since the model parameters are not statistically significant, this implies that the dispersion (distribution of the stochastic variable) of the error term is constant.

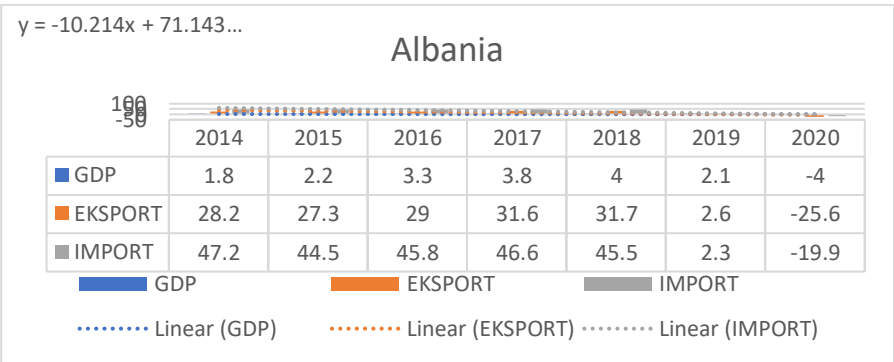
According to the data obtained, we notice that during 2019-2020 as a result of the covid pandemic 19 exports have significantly decreased from 7.6 to -29.1, at the same time economic growth and imports, all this comes as a result of the blockade of the country by COVID 19.

Chart 4.4. Kosovo



The same is observed in Albania due to the pandemic, exports and imports have marked a significant decline, and consequently economic growth from 2.1 to -4%.

Chart 4.3. Albania



4. Conclusions

Based on this study we have done where as the main data we have taken the impact of exports and imports on the economic growth of OECD countries these countries with high income economies with a very high index of human development, for a 7-year period. These countries make up 62.2% of the nominal global GDP and 42.8% of the global GDP and are estimated as economically developed countries and this organization includes the most economically developed countries in the world. During this work we realized that although there were large values of exports and imports do not have a very large impact on economic growth of these countries, and the reason may be the non-participation of other variables which affect this model, as the term error had a great value. After analyzing the economic links between exports and imports in the OECD country growth for a 7-year study period from 2014-2020, we concluded that exports positively to the economic economy while imports negatively, girls this comes as a result for the result. because these countries have been created quite a lot and part of the export is quite active. Finally, the alternative hypothesis is accepted, explaining that the two independent variables have an effect on the dependent variable.

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Corporate Governance: A Comparative Case Study of good and bad Business Practices

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Abstract

Inefficient corporate governance determines how companies perform business. The problem of inefficient corporate governance arises from institutional weaknesses, an insufficient tradition and the shortage of appropriate case studies, particularly in post-transition economies. Post-transitional institutional weaknesses translate into competitive disadvantages at the firm level. This is very important for small open economies like Slovenia and Croatia, explaining why case studies of good/bad corporate governance practices in these economies are important. This paper highlights certain differences in the corporate governance practices of Slovenia and Croatia. By analysing these practices, we add to the theory of corporate governance in post-transition economies while also offering valuable managerial implications. The purpose of our paper is to identify some advantages and weaknesses of the existing corporate governance practices in order to suggest ways to improve the corporate governance process. A comparative case study approach is used as the method of analysis. The strategic role of the supervisory board and active role of the financial creditors have impacted the corporate governance process and the implementation of better practices. Our study suggests that a thorough, transparent and independent reporting system is crucial to ensure efficient corporate control. We suggest that, to improve internal control, the internal audit department should be directly subordinated to the executive board. The independence of the internal audit committee and supervisory board have also had a strong impact on the efficiency of corporate governance. Good corporate governance and corporate responsibility are critical elements in resolving the financial and economic crisis.

Keywords: company, supervisory board, corporate governance, independence, reporting.

1. Introduction

Post-transition economies have faced certain characteristics of the corporate governance process that are incomparable with Western European developed economies; such characteristics include underdeveloped formal and informal institutions, the significant role played by the state due to an incomplete privatisation process, underdeveloped financial and labour markets, and certain structural changes. Both Slovenia and Croatia have encountered a triple-transition: the transition to an independent state, the reorientation from the former Yugoslav market to Western developed markets, and the transition to a market economy. It is noted that Croatia suffered much more than Slovenia due to the Yugoslav war. Therefore, Slovenia enjoyed a significant head start in the processes of transition and EU integration.

By 2008, prior to the last world economic crisis, the Slovenia economy had reached 90% of EU-27 GDP measured by purchasing power. The catching-up convergence process had gone in reverse and by 2016 Slovenia GDP had fallen to just 83% of the average EU-27 (Umar, 2018). Therefore, during the last world economic crisis we were witness to a process of the real divergence instead of convergence of the Slovenian economy from the most developed EU economies. We believe a key reason for this negative trend was an inefficient corporate governance process. The most recent world economic crisis shows the weaknesses of Slovenia's post-transition corporate governance model. Just before the economic crisis, in the period 2004–2007 the debt held by non-financial institutions in Slovenia doubled (Umar, 2009). On one hand, this was expected given the falling real interest rates due to introducing the euro as the national currency at the end of 2006. On the other hand, this was a time of non-transparent consolidation of the ownership structure (Lahovnik, 2009). Many management buy outs (MBOs) in this time were the outcome of inefficient corporate control. MBOs were often financed with short-term bank loans, even though such a practice offends basic financial standards and the usual corporate governance principles. Good corporate governance and corporate responsibility have been critical elements of resolution of the financial and economic crisis.

Discussions on corporate governance in Slovenia date back as far as 1993 when Slovenia adopted its first legal framework in this area. Slovenia then acceded to the European Union and the OECD. It adopted new directives and some new ones are still being

integrated into the country's legal system. By corporate governance standards, this period of 25 years' experience is short. This becomes very evident when noting there is a lack of jurisprudence to draw on that is able to offer guidance on what is right/wrong. It is important to know where the two countries under study come from and how far they yet have to go.

In contrast, Croatia has been lagging behind with implementation of the EU and OECD membership. It was in the negotiation EU process before the last world economic crisis and so was in a weaker position than Slovenia regarding the institutional development of corporate governance. In recent times, the topic of corporate governance has taken on a completely new dynamic in view of particular developments and practices that have been evolving for some time.

The main goal of this paper is to identify similarities and differences between the two countries in the corporate governance process. The method of analysis is a comparative case study based on case studies of two companies. Both companies are the biggest employer in each country, have the same majority owner as each other, and two-tier corporate governance systems. Therefore, the differences in the corporate governance system may be attributed to the institutional differences and practices of corporate governance.

Our research is exploratory in nature. Accordingly, we chose a comparative case study approach. Comparative case study analysis enables the collection of rich data to address the complexity of the corporate governance issue (Costley, Elliott & Gibbs, 2010). The reasons for employing a qualitative method and inductive approach are the following. First, the research topic concerns complex constructs of corporate governance in a post-transition institutional context. Second, the corporate governance issue covers many perspectives, levels of analysis and objectives. Therefore, the inductive approach enables a thorough understanding of the research context. Due to the exploratory nature of our research, the case study approach was considered to be a suitable research methodology (Yin, 2009). We wanted to obtain a deep understanding of the context of the research. Case study research has a considerable ability to generate answers to the questions of what, why and how (Myers, 2009; Silverman, 2011). Basic questions are how and why (Silverman, 2011; Myers, 2009) corporate governance practices differ between the two countries. Triangulation was assured by comparing interviews, analysis of secondary data as well as by the exploration method.

2. Literature Review

Mason and Simmons (2014) contend that a gap in research knowledge exists with regard to corporate social responsibility and how it is actually enacted by way of corporate governance systems. They hence emphasise the importance of taking a holistic approach to corporate governance and corporate social responsibility that integrates company, shareholder and wider stakeholder concerns. Some other scholars also support a holistic approach. Hoerisch, Freeman and Schaltegger (2014) identify three challenges in ensuring the sustainability of stakeholder relationships: strengthening the particular sustainability interests of stakeholders, creating mutual sustainability interests based on these particular interests, and empowering stakeholders to act as intermediaries for nature and sustainable development. They address these challenges with three interrelated mechanisms: education, regulation, and sustainability-based value creation for stakeholders. Another group of scholars argues we need to understand value creation and business as creating value for stakeholders. Understanding the economics of markets is important, but lying in the centre of starting, managing and leading a business is the set of stakeholder relationships that define the business (Parmar et al., 2010). Business firms face growing social and environmental demands and are required to act responsibly with respect to issues of public concern. These developments therefore challenge the received theory of the firm and the strict separation of its public and private domains. Corporations are becoming political actors (Scherer, Palazzo and Matten, 2014).

Instrumental stakeholder theory proposes that a positive relationship exists between fairness toward stakeholders and firm performance. However, we must consider that some firms are successful with an arms-length approach to stakeholder management due to their bargaining power rather than being a matter of fairness (Bridoux, Stoelhorst, 2014). Ferrero, Hoffman and McNulty (2014) suggest that, by accepting limited liability, Friedman must also accept the view that business is embedded in social interdependency, providing the logical and moral foundation for corporate social responsibility. Therefore, to be consistent with his own economic principles, Friedman must either abandon limited liability or modify his doctrine on corporate social responsibility and his related shareholder model of business.

The problem of inefficient corporate governance stems from institutional weaknesses, an insufficient tradition and the shortage of appropriate case studies, particularly in post-transition economies. This is most obvious in state-owned enterprises due to inefficient corporate governance (Georgieva, Riquelme, 2013). Post-transitional institutional weaknesses translate into competitive disadvantages at the firm level and strongly influence the corporate governance process on the micro level (Young et al., 2014). This is especially important for small open economies like Slovenia and Croatia, making case studies of good/bad corporate governance practices in these economies important. By analysing these practices, we add to the theory of corporate governance in post-transition economies while also offering important managerial implications.

3. Research Methodology. Results and Managerial Implications

In qualitatively analysing the characteristics of corporate governance, we applied the same criteria used for corporate governance assessment issued by EBRD experts that aim to measure the state of play (status, gaps between local laws/regulations and

international standards, effectiveness of implementation) in the area of corporate governance (EBRD, 2016). Five criteria are used: (1) structure and functioning of the board; (2) transparency and disclosure; (3) internal control; (4) rights of shareholders; and (5) stakeholders and institutions (see Figures 1 and 2). The extremity of each axis represents an ideal score, i.e. corresponding to the standards established in best practices and international standards (e.g. OECD Corporate Governance Principles). The fuller the 'web', the closer the corporate governance legislation and practices of the country approximates best practices. Key: 1) Very weak; 2) Weak; 3) Fair; 4) Moderately Strong; 5) Strong to very strong (EBRD, Corporate Governance Assessment 2016).

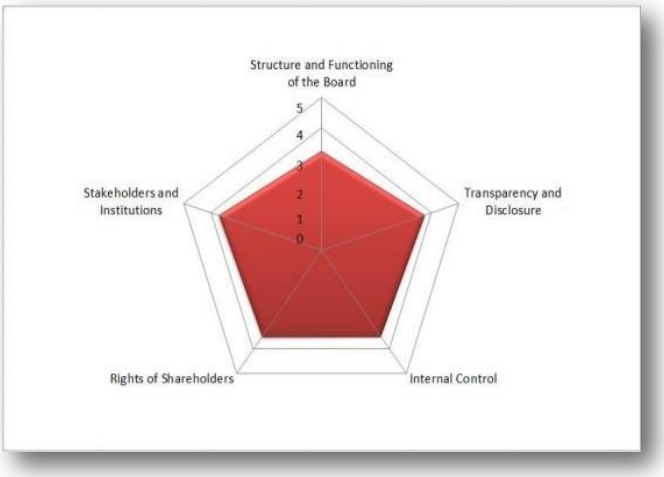

Figure 1: Corporate governance in Slovenia

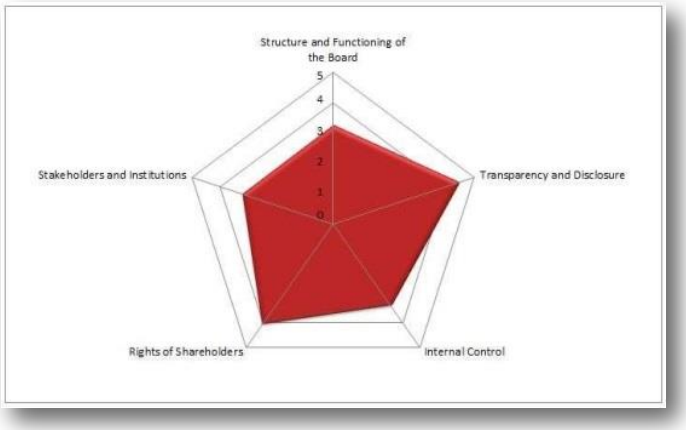

Figure 2. Corporate governance in Croatia

We decided to use the case study approach with the desire to gain a deeper holistic view. The qualitative approach enables us to explore the relationship between the executive, the supervisory board and the owners. A comparison of two cases in neighbouring post-transition countries was undertaken to describe, crystallise and explain the dynamics of corporate governance. Our study is exploratory in nature. We triangulate different data sources such as a literature review, business report review and informal qualitative approaches so as to overcome the weakness and intrinsic biases. We met both conditions for using such an inductive approach: a contemporary and thorough understanding of the corporate governance issue as well as close involvement in the research process (Saunders, Lewis, & Thornhill, 2003). We therefore also relied on the observation method. By selecting representative companies for the comparison, we reduced the fundamental weakness of case studies, that is, their inability to allow generalisations. A summary of the comparison of the qualitative research results is shown in Table 1.

By establishing the performance criteria to be applied, the system and practice of corporate governance have significantly determined the competitive advantages of companies in both cases. For the Slovenian company, an agency problem existed until 2012 due to the supervisory board's structure. Managers manifested a hubris hypothesis due to the unrealistic belief they held that they would be able to manage the acquired firm's assets more efficiently than the acquired firm's current management (Jensen,

1988; Roll, 1986). Such hubris can explain why the Slovenian company has engaged in so many failed acquisitions and why it simply overestimated the different synergies and paid too much for their acquisition targets.

The acquisitions the Slovenian company made have been financed using high financial leverage. On one side, this high financial leverage and on the other the failed realisation of synergies strongly negatively impacted its business performance and rating. Therefore, since 2012 the company has been engaged in an extensive process of triple restructuring: ownership, financial and operating. After the supervisory board's structure was changed, the supervisory board elected a new executive board. Both the strategic and control roles of the supervisory board have been strengthened. For example, the managerial performance criteria have been altered. The new criteria are specific, measurable, attainable, relevant and time-defined. With the help of the Human Resource committee, the managerial performance is evaluated yearly. Some limitations on investment decisions are also being implemented. For example, any investment real-estate decisions involving over EUR 5 million must be approved by the supervisory board.

Table 1. Corporate governance in comparison

Criteria	Slovenian company	Croatian company
Structure and functioning of the supervisory board	Supervisors must make a statement regarding their independence from the supervised company. A nomination procedure concerning the selection of the supervisors is not required. The supervisory board's structure is well balanced with respect to functional knowledge as well as the nationalities, and less balanced in gender diversity. Materials must be submitted at least one week before a session. With the approval of supervisors, this time frame may be shortened in special circumstances or extraordinary events. All supervisors need to give their formal approval for a correspondence session. Two independence committees support the supervisory board's work: audit committee and HR committee. The supervisory board self-evaluates its work once a year.	There is no nomination procedure regarding the selection of the supervisors. The supervisory board's structure is well balanced, except for gender diversity. The issue of independence should be better defined and solved. An audit committee is mandatory. The supervisory board does not have its own secretary and the self-evaluation of work is not regularly implemented. No representatives of the workers elected by the independent workers' body sit on the supervisory board. If we consider the frequency of sessions, we may assume that both the strategic and control role of the supervisory board is not fully implemented.
Transparency	Regular public notification of all relevant business information through SEO-net is mandatory. Compliance with the Code of Corporate Governance is explained in the annual report the. Reasons for any inconsistencies with the Code of Corporate Governance should be explained thoroughly. The annual report also includes detailed non-financial information. Special attention is paid to conflicts of interest.	Public notification of all relevant business events is the usual practice. However, non-financial information regarding the board's structure and diversity could be more thorough. A regular outside audit of the business is required and implemented.
Internal control	The independent audit committee of the supervisory board contains internal and external members. At least one external member should be an expert in accounting. The audit committee of the supervisory board has at least one annual meeting with the external auditor without the executive board being present. The internal audit committee reports directly to the supervisory board. The company reports on business relations among dependant companies. External evaluation of the internal audit system is done periodically. The company also has designed an internal whistleblowing system. The system is anonymous. Yet, the institutional protection of whistle-blowers is not implemented properly.	The supervisory board does not have its own independent audit committee made up of internal and external members of that board. Internal audit is not an autonomous department in the organisational structure that reports directly to both the executive and the supervisory board. The internal audit system is not required to be externally evaluated periodically. The external auditor has not been changed regularly in the past. An obvious conflict of interest regarding the external »independent« auditor existed and was not solved until 2017. An internal whistleblowing system has not been designed and the institutional protection of whistle-blowers is not implemented.
Rights of shareholders	Upon the nomination of the supervisory board, the shareholder meeting has the exclusive right to elect the external auditor. Derivative measures can be implemented with the support of 10% of capital. The shareholder meeting's agenda must be determined and announced at least 30 days before a meeting. Each shareholder has the right to discuss, ask questions and provide proposals at the shareholder meeting.	Regulated under EU law. The shareholder meeting's agenda must be determined and announced at least 21 days before the meeting. Conflicts of interest are not regulated transparently enough. Reporting on dependent companies is inappropriate and required by the Code of Corporate Governance, but the absence of a practice of thoroughly reporting on this issue at the shareholder meeting is obvious.
Stakeholders and other institutions	Employees' participation in the corporate governance process is high. The council of workers elected half the members of the supervisory board until 2012. After 2012, this figure was reduced to one-third of supervisory board members. The council of workers provides its opinion and proposals regarding employee issues. The Code of Corporate Governance designed by the stock exchange and Association of Slovenian Supervisors is followed. Any inconsistencies regarding the Code of Corporate Governance are reported.	No representatives of workers elected by the council of workers sit on the supervisory board. The Code of Corporate Governance complements the law and is formally followed. Yet, reporting on possible inconsistencies in implementing the Code of Corporate Governance is weak. Reasons for such inconsistencies are not explained thoroughly enough.

In the case of the Croatian company, the biggest weakness was the insufficient control over operations until 2017. The external auditor had a typical conflict of interest by being dependent on the audited company. Most of the income was made by only one company. The supervisory board did not play an appropriate strategic and control role until 2017. Therefore, no independent audit committee or independent human resource committee had been established or put into practice. The reporting system's quality was much lower than for the Slovenian company due to the absence of an independent audit system. The system of reporting on relations with dependant companies was weak, even misleading. In 2017, the company underwent a radical ownership, financial and operating restructuring process. The financial creditors decided to implement new control mechanisms.

4. Conclusion

By analysing these two case studies, we found that both companies have struggled significantly due to certain weaknesses in the respective corporate governance system. Improving corporate governance was indispensable for the business restructuring of companies. The strategic and control roles of the supervisory board have been strengthened in order to simultaneously implement equity, financial and operational restructuring. The improvement of the reporting and control mechanisms in both companies has been the result of a more active role of the stakeholders. The more active role of creditors in the business-financial restructuring process has also been important.

We argue that the absence of long-term strategic owners continues to be a serious problem for post-transitional economies. A stable ownership structure is necessary if efficient practices of corporate governance are to be introduced and maintained. The data collected and the case study comparative analysis also hold important managerial implications. We suggest that to improve internal control the internal audit department should be directly subordinated to the executive board. The comparative case study analysis highlights that the independent audit committee of the supervisory board is essential for efficient corporate control. The supervisory board should also establish an independent human resource committee to measure and evaluate the executive board's performance. When independent committees and an independent information system are missing, efficient corporate control by the supervisory board proves to be a 'mission impossible'.

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