THE IMPORTANCE GIVEN BY ROMANIANS TO RESEARCH AND INNOVATION IN ORDER TO ENSURE FUTURE DEVELOPMENT

Maria Livia ȘTEFĂNESCU, PhD in Sociology, Researcher,
Research Institute for the Quality of Life,
Romanian Academy, Romania
https://orcid.org/0000-0001-8482-6050, livia.stefanescu@gmail.com

Abstract. In this paper we will analyze to what extent Romanians are aware of the need to develop the research and innovation domains to promote progress in the coming years for Romania. The study is based on Romanians' answers to questions from a questionnaire attached to a Eurobarometer. Please note that the Eurobarometer used was completed in May 2021 and includes the opinions of 1050 adults from Romania. Basically, will be estimated the trends of Romanians' perceptions regarding the following aspects: SciSoc, NewTech, AreasRI, Explain. We specify below some details regarding the four mentioned fields of our study. So, SciSoc defines the variable attached to the answers to the question: "Do you think that the overall influence of science and technology on society is: very positive, fairly positive, fairly negative, very negative?". The NewTech variable sets on a four-value scale the intensity of perception for the positive effect of ten new technologies on life orientation over the next 20 years. The variable AreaRI is attached to the Eurobarometer question "In the coming years, which of the following 13 areas do you think will be affected most by research and innovation?".The answer to the question "Who is the best qualified to explain the impact of scientific and technological developments on society?" is characterized by the variable Explain. There are 15 possible answers. We defined the TREND indicator which is compatible with the classical stochastic ordering relationship between categorical ordinal variables of this study. The application of homogeneity statistical tests revealed perceptible differences of opinions between people belonging to different types of communities.
Keywords: research and innovation, Romania, sample, questionnaire, perception, trend, statistical test, categorical ordinal variable
JEL: C4, C5, C8, O3, Q5
UDC: 001.895(498)

Introduction. Science, technology and innovation play an extremely important role in ensuring the progress of the society, while improving the effects of the various global crises that may occur at any time.

The purpose of this exposure is to assess to what extent Romanians are aware of the importance of science, research and innovation for future sustainable development, prevention and mitigation of major crises, or for improving the daily lives of the population.

We point out that some of the issues we are going to present are the synthesis of partial research that we have undertaken assessing the role of science, innovation and technology in tackling global crises.

We recall that mankind has now moved into a new phase of industrialization, namely, the phenomenon based on the concept of interconnectivity. At the same time, we recall the four important steps before this process of development, that are: industrialization which has made use of the force of steam, which has been continued by widespread use of electricity, the period of intense use of nuclear energy, followed by frequent use of the power of computers (the digital age). However, for each specific stage of industrialization, the actual approach to science and research varies.

The current research is based on a statistical analysis of the responses of Romanians to questions in a questionnaire. These responses are collected in a Eurobarometer that was finalized in May 2021 (Survey1). Specifically, the Eurobarometer polled 1,050 people with different IC characteristics, such as: gender, age, education, type / size of community, the level of poverty, social class, development region of Romania.

Literature review. Most of the world's governments and, in particular, the groups of developed countries, are fully aware of the importance that should be attached to science, research and innovation for the sustainable development of those countries and for raising the quality of life of their citizens.

This is also reflected in the six priorities listed by the European Union on its site (https://commission.europa.eu/). This underlines that research and innovation must play a key role in protecting citizens and European values. The focus is on citizens' health, healthcare, care for the elderly, preventing crises in the healthcare system. The EU also promotes a European digital decade geared towards a new generation of technologies, the processing of big data, developing infrastructure, science, the same innovation or large-scale knowledge processing. The aim is the sustainable development of the European space.

Another EU priority concerns protection of the environment, swift and resolute action to improve climate conditions (https://commission.europa.eu/).

The EU aims to rethink production and consumption in a spirit of respecting global limits, a process geared towards the well-being of producers.

It is frequently highlighted in the literature that research and innovation drive mankind's progress decisively and at the same time mitigate the brutal manifestation of global crises. In turn, research and innovation are affected at different levels by the adverse effects of major crises (Izsak et al., 2013).

We point out that in recent decades, numerous interdisciplinary models have been designed to understand reality and at the same time to try to solve, at least in part, the many complex problems caused by the environment (Le Treut et al., 2007).

There is no important field in practice that is not more or less influenced by the conquests of science. We will continue to give more examples by referring only to issues related to ensure the food security (UNCTAD, 2017). In particular, the UNCTAD-2017 Conference stressed the need for close scientific collaboration

between farmers and scientists, highlighted the role of information and communications technologies for extension services among farmers, called for the promotion of biotechnology in order to achieve genetic transformations to increase food resources, insisting on the development of complex systems managing diversified food-related aspects (production, transport, distribution, research, etc.).

Several policies addressing food security were proposed at the UNCTAD Conference (2017). Among other things we mention: increasing national and global investment in agricultural R&D, promoting food security measures in a sustainable and coherent way, informing, collaborating and facilitating access to innovation for farmers, linking the actions of farmers to frequent environmental problems.

The ideas for a holistic approach to research and innovation (European Commission, 2021) appear in the materials promoted by the EU regarding the major impact of science on socio-economic aspects. This reaffirms a global openness to exchange scientific data while creating new, high-quality, internationally collaborative research and innovation centers. Researchers are given a democratic environment that respects certain standards. The central idea is to pool the global EU efforts to jointly address the major challenges of the world in which we live.

We recall that the EU aims to develop international digital partnerships on a multitude of topics, of which we draw attention: to improving digital connectivity; to the development of human-centered regulation; to develop new technologies for health and education; to prioritize the "green" transition; to develop the "object-oriented" internet; to increase the use of artificial intelligence; to process big data and also spatial data.

Deep scientific knowledge formed the basis for proposing the myriad policies that are being implemented, especially in times of crisis, in a particular area. This is also the case with the outbreak of the global Covid-19 crisis, which has had repercussions in multiple economic and social areas (Monti & Wacks, 2021).

So, the scale of the impact of science and new technologies is obvious in terms of both economic growth and improving people's daily lives. We also note the special role attributed to science in promoting sustainable development at national level (Anaeto et al., 2016).

A framework document on the national research, innovation and smart specialization strategy 2021-2027 is presented in Annex 1, edited by the Romanian Ministry of Research, Innovation and Digitalization (Government of Romania, 2021). We note from this document several lines of action, such as: increasing the number of researchers in Romania's research-innovation ecosystem; ensuring the conditions for a transition to open science and facilitating the way for excellence in scientific research; creating competitive public research organizations and ensuring the sustainability of innovation results; linking research and innovation activities with current social challenges; supporting smart specialization at national level; supporting and encouraging public-private collaboration to engage in innovation projects and to leverage innovation results; developing innovation to leverage; to spread innovation results. We also want an increase in participation in both

European Union and international research and innovation programs.

The digital transformation of Romania must be in line with the European transformation. This transformation will benefit from the staggering progress of new technologies, particularly artificial intelligence, nanotechnologies and biotechnologies, big data or robotics. Details of the intentions to digitalize education in Romania are specified on the Ministry of Education and Research website (2021). The document expressly requires that every man permanently invest in improving his or her digital skills. It is disappointing, however, that a 2019 Eurostat survey ranked Romania last in the EU taking into account the low digital skills of the population. Specifically, only 10% of Romanians have higher digital skills. Moreover, young people in Romania are also last in the EU if we relate to their basic digital skills. Thus, only 56% of people in Romania aged 16-24 have basic digital knowledge compared to 80% in the EU.

With this in mind, we are interested in assessing the concrete impact of science and new technologies on society as perceived by Romanians.

Issue addressed. Basically, will be estimated in this study the trends of Romanians' perceptions regarding the following aspects: SciSoc, NewTech, AreasRI, Explain.

We specify below some details regarding the four mentioned fields of our study.

So, SciSoc defines the variable attached to the answers to the question: "Do you think that the overall influence of science and technology on society is: very positive, fairly positive, fairly negative, very negative?".

The NewTech variable sets on a four-value scale the intensity of perception for the very positive effect to the very negative influence of new technologies on life orientation over the next twenty years. The following ten components of new technologies are considered: Solar energy (SolarEn), Wind energy (WindEn), Information and communication technology (InfComm), Brain and cognitive enhancement (CognEnh), Vaccines and combatting infectious diseases (VaccinD), Biotechnology and genetic engineering (Biotech), Space exploration (SpaceEx), Nanotechnology (Nanotec), Nuclear energy for energy production (Nuclear), Artificial Intelligence (ArtInte). The abbreviation used is mentioned in brackets.

Given the possibilities of answering to SciSoc's question, in the following paragraphs we'll interpret the SciSoc and NewTech variables as categorical ordinal type variables (Agresti, 2010).

The variable AreaRI is attached to the Eurobarometer question "In the coming years, which of the following areas do you think will be affected most by research and innovation?". For this variable we must chose maximum three responses from the following 13 options concerning the main future application of the research and innovation: Fight against climate change (Climate), Protection of the environment (Environ), Security of citizens (SecureC), Job creation - obtain (JobCreat), Energy supply (EnergyS), Health and medical care (HealthC), Protection of personal data (ProData), Reduction of inequalities (Inequal), Adaptation of society to an ageing population (Ageing), Availability and quality of food (QuaFood), Transport and transport infrastructure (TranspI), Education and

skills (EduSkil), Quality of <u>housing</u> (Housing). We have mentioned the abbreviation of the option in brackets.

The answer to the question "Who is the best qualified to <u>explain</u> the impact of scientific and technological developments on society?" is modeled by the variable Explain.

We must choose from 15 possible answers, that are: Scientists working at a <u>univer</u>sity or <u>gover</u>nment-funded research organization (UnivGov); Scientists working in an <u>indus</u>trial or <u>priva</u>tely funded research organization (IndPriv); <u>Journal</u>ists (Journal); <u>Politic</u>ians (Politic); <u>Consum</u>er organizations (Consum); <u>Environ</u>mental protection associations (Environ); Industry and <u>private</u> <u>companies</u> (PCompan); People active on online social <u>networks</u> and bloggers (Network); <u>Religio</u>us leaders or representatives (Religio); <u>R</u>omanian <u>govern</u>ment (RGovern); The <u>military</u> (Militar); General <u>practit</u>ioners and specialist doctors (Practit); Writers and <u>intelle</u>ctuals (Intelle); <u>Family</u> and <u>friends</u> (FamilyF); The European Union (EU).

Methodological aspects. The random variables SciSoc and NewTech are ordinal type categorical variables. In this situation it is mandatory to apply specific methods of statistical analysis (see Agresti, 2010).

Let $\underline{p}$ = (p1, p2, p3, p4) be the vector which defines the distribution of SciSoc ordinary categorical variable. Thus, the p1, p2, p3, p4 components of the <u>p</u>-distribution represent the probabilities that the SciSoc question will be answered "very positive "," fairly positive ", "fairly negative " and" very negative " respectively.

Specifically, in an earlier study (Stefanescu, 2015) we proposed and justified the following indicator TREND(<u>p</u>) of the <u>p</u>-distribution trend:

TREND(<u>p</u>) = (2 + p1 − p3 − 2*p4) / 3

We recall some defining properties of the TREND indicator (Stefanescu, 2015).

So, for any distribution <u>p</u> we have $0 \leq TREND(\underline{p}) \leq 1$.

Obviously TREND((1, 0, 0, 0)) = 1 and TREND((0, 0, 0, 1)) = 0, properties which are absolutely necessary for an index to measure the trend of the distribution p.

Statistical models frequently use the classical "$<_s$" stochastic order relationship to establish the ratio of two random variables (Le Breton & Peluso, 2009). We have demonstrated that the TREND index is compatible with the partial stochastic order relationship "$<_s$" between the distributions <u>p</u> and <u>q</u> of two random variables (Stefanescu, 2015). More precisely, for any <u>p</u> and <u>q</u> distributions in relation $\underline{p} \leq_s \underline{q}$ we also have the inequality TREND(<u>p</u>) ≤ TREND(<u>q</u>) .

Statistical data processing will also implement a chi-square statistical homogeneity test (Alkarkhi, 2021). The null hypothesis H0(X,Y) of homogeneity for the distributions of the variable Y shall be verified regardless of any categories specified by the values of X. If the X and Y variables have already been specified, instead of the notation H0(X,Y) we will also use the abbreviated expression H0. For the chi-square homogeneity test having α as a statistical test of significance (Alkarkhi, 2021) the following indicators will be evaluated: degrees of freedom (gf), the null hypothesis H0 rejection threshold (rej2) and the statistics of test (chi2). Practically, we will reject the null hypothesis H0 if the inequality chi2 >

rej2 is valid. In this situation we will assume a probability risk α to make a wrong decision. Concretely, we'll operate in the subsequent with the standard risk value $\alpha = 0.05$ (Alkarkhi, 2021).

Romanians' views of the questions SciSoc and NewTech concerning the influence of science and new technologies over the next few years on the daily life of citizens could depend significantly on the individual characteristics IC of the interviewees. In this respect, we have taken into account the location loct variable defined by the type of residence of the respondent to the Eurobarometer questionnaire. We're only going to operate with three types of communities: rural area / village, small / middle town and large town.

The actual application of the chi-square statistical homogeneity test will refer to the verification of the assumptions H0(loct, SciSoc) and H0(loct, Y), where by Y we have designated any of the ten components of the NewTech vector.

Finally, we mention that the initial Eurobarometer sample was weighted for processing taking into account the real proportions of the various socio-demographic categories in Romania, at the level of 2021.

Partial results. The perception of the future influence of science and technology on society

We remind that SciSoc defines the variable attached to the answers to the question: "Do you think that the overall influence of science and technology on society is: very positive, fairly positive, fairly negative, very negative?". So, the SciSoc variable is a categorical variable of ordinal type.

In general, 15% of Romanians perceive a very positive influence of science on society. Most Romanians are fairly positive about the role of science (59.5%). The negative appreciation of the importance to science is about 25%, that are "fairly negative" (20.4%) and "very negative" (5%).

I expect that answers to SciSoc's question would also depend on the residence type (loct) for the person questioned. We will clarify this issue in another section.

The influence of new technologies. I have mentioned before the ten new technologies that make up the NewTech vector. We are interested in ranking NewTech technology in relation to the influence that it may have on the lives of individuals in the next 20 years.

People interviewed about the possible future influence of NewTech technologies have a choice between the following response options: very positive, fairly positive, fairly negative, very negative.

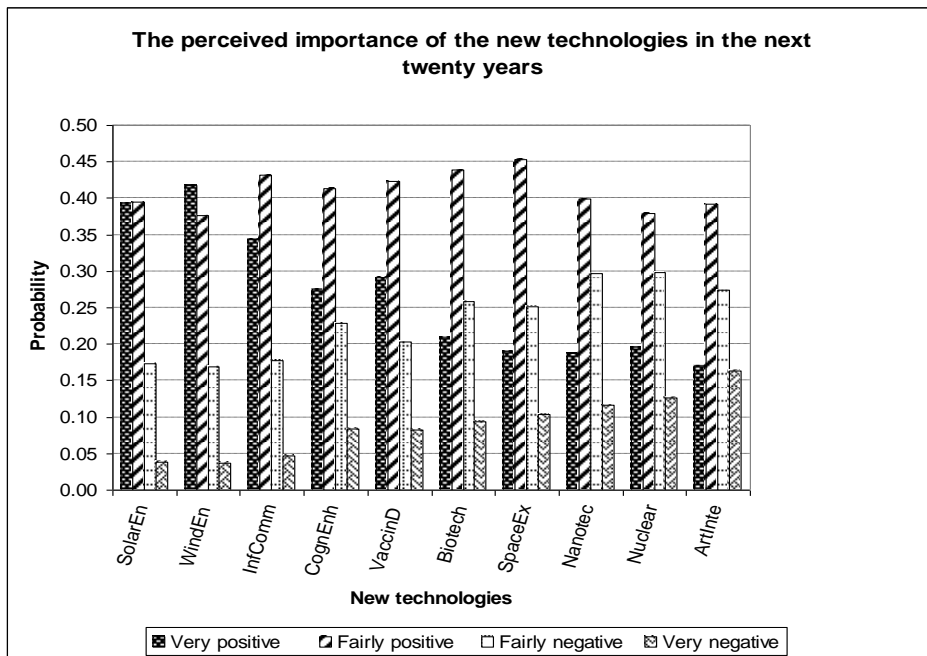The distributions of the NewTech components are shown in *Figure 1*.

Figure 1. **The distributions of the New Tech categorical variables (whole sample)**
Source: Own computation

By interpreting the probabilities visualized in *Figure 1* we deduce a positive perception of new technologies in Romanians over the next 20 years. Solar power (SolarEn), wind energy (WindEn), information and communication (InfComm) are the top positions.

We also note the importance granted by Romanians for studies related to improving the cognitive capacity of the brain (CognEnh) or for developing vaccines against diseases (VaccinD).

A lower appreciation of the influence of new NewTech technologies is for nanotechnologies (Nanotec), nuclear energy (Nuclear) or artificial intelligence (ArtInte).

A more precise ranking of the NewTech variables than that promoted by *Figure 1* can be achieved with respect to the TREND indicator values. Thus, in *Figure 2*, the TREND values for the NewTech variables are illustrated.
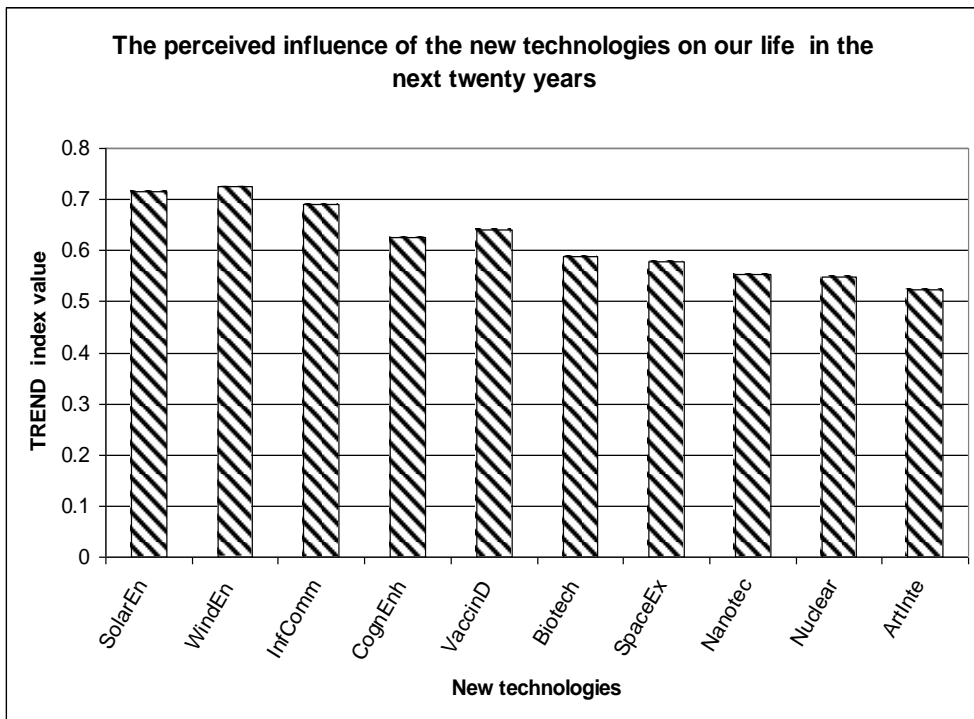
Figure 2. **The trend Romanians perceive for the possible influence of new technologies over the next twenty years**

Source: Own computation

Interpreting *Figure 2* we conclude that the TREND coefficient assessment of the degree of influence for new technologies varies from 0.52 (artificial intelligence) to 0.73 (wind energy). Therefore, most of the Romanian population perceives positively the importance of applying science, innovation and technology to improve their lives in the 2040s (TREND($\underline{p}$) > 0.5).

So, previous observations initially derived from *Figure 1* are more clearly confirmed by the interpretation of TREND values visualized in *Figure 2*.

From *Figure 2*, it appears that Romanians opinion give visibly lesser importance to the fields of nanotechnology (Nanoteh), nuclear energy (Nuclear) and artificial intelligence (ArtInte). This could be due to a lack of knowledge about these particular fields of technology. These assessments certainly vary substantially depending on the level of education, the consistent interest shown, the age of the person or the practical way in which the individual is informed. In such a context, we also note a moderate appreciation by Romanians of studying the cognitive capacity of the brain (CognEnh) or for developing new anti-disease vaccines (VaccinD).

Decreasing the values of the tendency of the scientific perceived intake to change the daily life of the population, the following ranking is obtained: WindEn > SolarEn > InfComm > VaccinD > CognEnh > Biotech > SpaceEx > Nanotec > Nuclear > ArtInte.

Therefore, Romanians believe that wind power (WindEn), solar power (SolarEn), together with information and communication processing (InfComm) will cause the most significant changes in their lives. At the bottom three in the previous ranking are nanotechnologies (Nanotec), the exploitation of nuclear energy (Nuclear) or artificial intelligence (ArtInte).

Our resulting ranking has a high degree of subjectivism, which is supported by the various individual characteristics IC of the respondents to the Eurobarometer questionnaire. We believe that for most Romanians the definition of artificial intelligence, a technology of vanguard which is the last in the appreciation of the Romanian population, is not clear.

The areas influenced by the new technologies. We will highlight the main areas that Romanians believe will be influenced as a matter of priority in the future by the development of new technologies. The 13 areas considered are the components of the AreaRI vector which were specified in an earlier section.

Taking into account the opinions of the Romanians of May 2021 (Survey1), a top-down ranking of these 13 areas whose development depends heavily on the use of new technologies is achieved. Specifically, we have the following downwards hierarchy characterized by the perceived importance of interviewees: Health and Health Care (33.4%) > Job creation (25.2%) > Citizens' safety (22.2%) > Education and skills development (20.6%) > Availability and quality of food (18.4%) > Environmental protection (17.1%) > Climate change (13.5%) > Transport and infrastructure (12.2%) > Personal data protection (11.7%) >
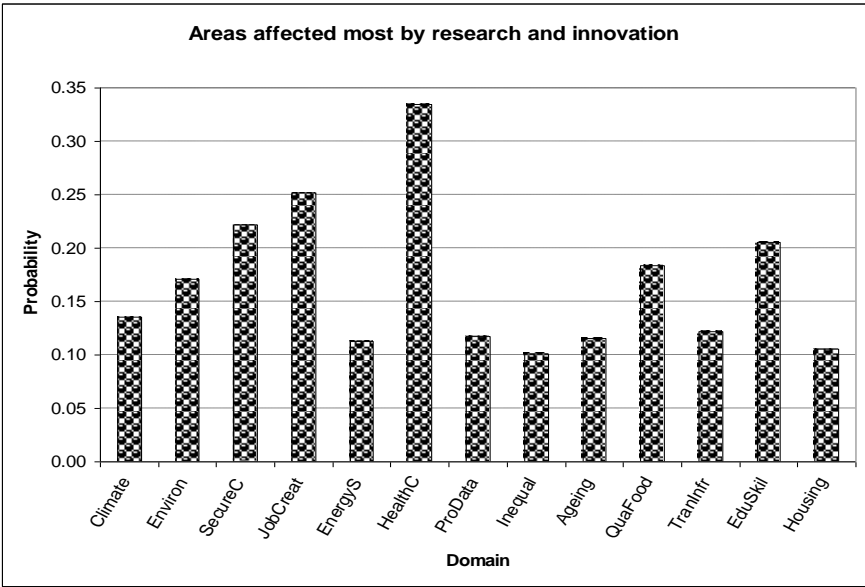

Figure 3. **The domains affected by research and innovation in the next twenty years**
Source: Own computation

Figure 3 shows the values of the probabilities for the chosen domains influenced by new technologies.

Vector Explain

In an earlier section I mentioned 15 possible entities that could best explain the societal impact of science and technological development (vector Explain).

The importance given by Romanians to the different components of the Explain vector is illustrated in *Figure 4*.
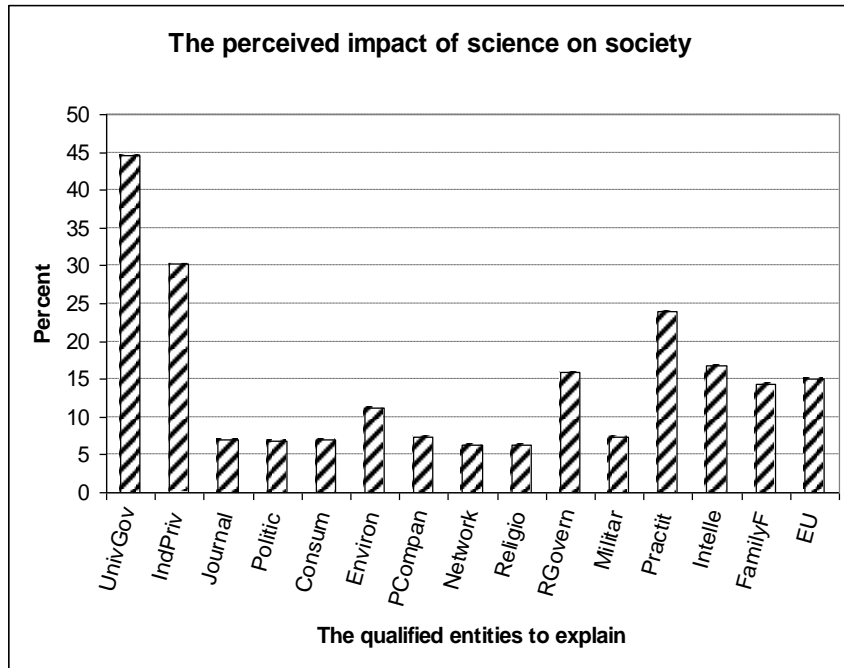

Figure 4. **The importance the Romanians perceive for the 15 variables Explain**
Source: Own computation.

From *Figure 4* it is clear that the most qualified entities able to explain best the impact of science and technology on society are: Scientists working at a university or government-funded research organisation (UnivGov); Scientists working in an industrial or privately funded research organisation (IndPriv) and General practitioners and specialist doctors (Practit). The last two places for a correct explanations are: Religious leaders or representatives (Religio) and People active on online social networks and bloggers (Network). The European Union (EU) has a moderate influence on explaining the usefulness of science, along with: Writers and intellectuals (Intelle), Romanian government (RGovern) and Family and friends (FamilyF).

The importance of the individual characteristics of the interviewees. Romanians' opinions may differ substantially in relation to the individual IC characteristics of the interviewees. As IC attribute we can consider: gender, age, education, type of community, the level of poverty, social class, working status, Romanian regions of development. In the present work we will focus only on the type of residence of the respondent to the questionnaire (loct). The categorical loct variable has three classes: rural area or village, small or middle sized town, large town.

The perception of the possible influence of science, innovation and technology on the evolution of Romanian society differs significantly in relation to the type of resident community of the respondent (variable loct). The TREND(SciSoc, loct) coefficient of positively influencing science and innovation to the benefit of society is about 0.6, with a slight increase from rural / village to small towns and then to large cities (*Figure 5*).
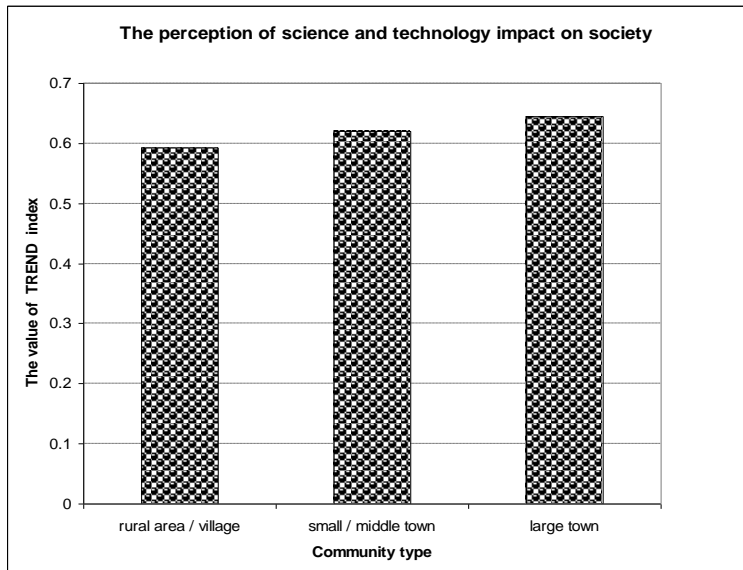

Figure 5. **The perception of science and technology on society is influenced by the type of the respondent community (variable loct)**

Source: Own computation

A similar analysis was conducted regarding TREND(Y, X) values with $Y \in$ NewTech şi $X \in$ loct. Most of the time there is an increase in perceived trends of new technologies depending on the type loct of community. Thus, usually TREND(Y, rural) < TREND(Y, middle town) < TREND(Y, large town), for $Y \in$ NewTech.

So, the impact perceived by the new technologies could therefore depend heavily on the type of residence of the interviewer. In this context we shall apply a chi-square statistical homogeneity test to validate the null hypothesis H0(Y, loct): "Answers about the impact of Y, $Y \in$ NewTech, do not depend on the type of locality where the respondent resides".

Specifically, the null hypothesis H0(Y, loct) of homogeneity is rejected for most Y, $Y \in$ NewTech. Basically, it resulted chi2 (Y) > rej2 (Y) = 12.6 for α=0.05.

More specifically, with the exception of nanotechnologies (Nanotec) and artificial intelligence (ArtInte), the impact perceived by all other technologies depends on the type of community where the respondent belongs to.

In the case of nanotechnologies and artificial intelligence, Romanians have similar views, independent of the type of community. However, on these top technologies this could also be due to a lack of accurate and in-depth information for some people.

435

Conclusions. The research was conducted on the basis of a questionnaire and questions were addressed to Romanians. The data used in the statistical analysis were taken up and processed from a Eurobarometer completed in May 2021.

The impact of science and technology on society as perceived by the Romanians (the SciSoc variable) was first assessed in this study. About 75% of respondents notice a positive influence of science and technology on Romanian society. However, this perception depends on the type of community of the respondent to the questionnaire.

We remark a positive perception of new technologies (NewTech vector) in the lives of individuals for the next 20 years. This is also illustrated by the inequalities of $TREND(Y) > 0.5$ for all ten Y-technologies considered (*Figure 2*). The use of TREND values allowed a decreasing hierarchy of technologies in relation to perceived utility (*Figure 2*). We note that Romanians ' assessments of the importance of different NewTech technologies are not homogeneous and depend on the type of community of the interviewer. In the case of the influence of nanotechnologies and artificial intelligence, the assessments of the persons questioned are homogeneous regardless of the type of community. However, this could also be due to insufficient information on the potential of the areas concerned.

A ranking of the 13 AreaRI domains has been achieved and will be influenced as a matter of priority by developments in new technologies. At the top of the scale is: Health and Health care (33.4%), Job creation (25.2%), Citizens' safety (22.2%), Education & skills development (20.6%).

The Explain variable defines 15 possible entities that could best explain the impact on society due to science and technological development. The first three positions include the categories: Scientists working at a university or government-funded research organisation, Scientists working in an industrial or privately funded research organisation; General Practitioners and specialist doctors. In this context, a modest influence has to do with: Religious leaders or representatives; People active on online social networks and bloggers.

We are going to expand the current research into the dependency of the SciSoc, NewTech, AreaRI and Explain vectors to the individual IC features of the interviewees. Among the IC's attributes we mention: gender, age, education, type / size of community, the level of poverty, social class, working status, development region of Romania.

REFERENCES

Agresti, A. (2010). *Analysis of ordinal categorical data*. Second edition. Wiley: New York.

Alkarkhi, A. F. M. (2021). *Applications of hypothesis testing for environmental science*. Amsterdam: Elsevier.

An official website of the European Union. https://commission.europa.eu/

Anaeto, F. C., Asiabaka, C. C., Ani, A. O., Nnadi, F. N., Ugwoke, F. O., Asiabaka, I. P., Anaeto, C. A., & Ihekeronye, N. (2016). The roles of science and technology in

national development. *Direct Research Journal* of *Social Science* and Educational *Studies*, 3(3), 38-43.

Comisia Europeană. (2021, 18 mai). *Abordarea globală a cercetării şi a inovării - Strategia Europei privind cooperarea internaţională într-o lume în schimbare*. COM 252 final. Bruxelles.

European Commission. (2022). *Eurobarometer 95.2 (2021)*. GESIS, Cologne. ZA7782 Datenfile Version 1.0.0. Brussels. https://doi.org/10.4232/1.13884

Guvernul României, Ministerul Cercetării Inovării şi Digitalizării. (2021, 17 noiembrie). *Document cadru privind strategia naţională de cercetare, inovare şi specializare inteligentă 2021-2027*. Anexa 1. Bucureşti.

Izsak, K., Markianidou, P., Lukach, R., & Wastyn, A. (2013). *The impact of the crisis on research and innovation policies*. Study for the European Commission, *DG Research* by Technopolis Group Belgium and Idea Consult.

Le Breton, M., & Peluso, E. (2009). Third-degree stochastic dominance and inequality measurement. *Journal of Economic Inequality*, 7, 249-268.

Le Treut, H., Somerville, R., Cubasch, U., Ding, Y., Mauritzen, C., Mokssit, A., Peterson, T., & Prather, M. (2007). Historical overview of climate change. In: Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K. B., Tignor, M., & Miller, H. L. (Eds.). *Climate change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge, United Kingdom: Cambridge University Press.

Ministerul Educaţiei şi Cercetării (2021). *Strategia privind digitalizarea educaţiei în România*. Document în consultare publică în perioada 18 decembrie 2020 - 15 februarie 2021 (www.edu.ro)

Monti, A., & Wacks, R. (2021). *Covid-19 and public policy in the digital age*. New York: Routledge.

Ştefănescu, M. L, & Ştefănescu, S. (2015, December 3-4). An indicator for measuring the evolution aspects for ordinal data. In: *Economic Scientific Research - Theoretical, Empirical and Practical Approaches*: paper presented at The 3rd International Conference ESPERA-2015 (p. 10). Bucharest, Romania.

United Nations Conference on Trade and Development (UNCTAD). (2017). *The role of science, technology and innovation in ensuring food security by 2030*. UNCTAD/DTL/STICT/2017/5. New York, Geneva.